



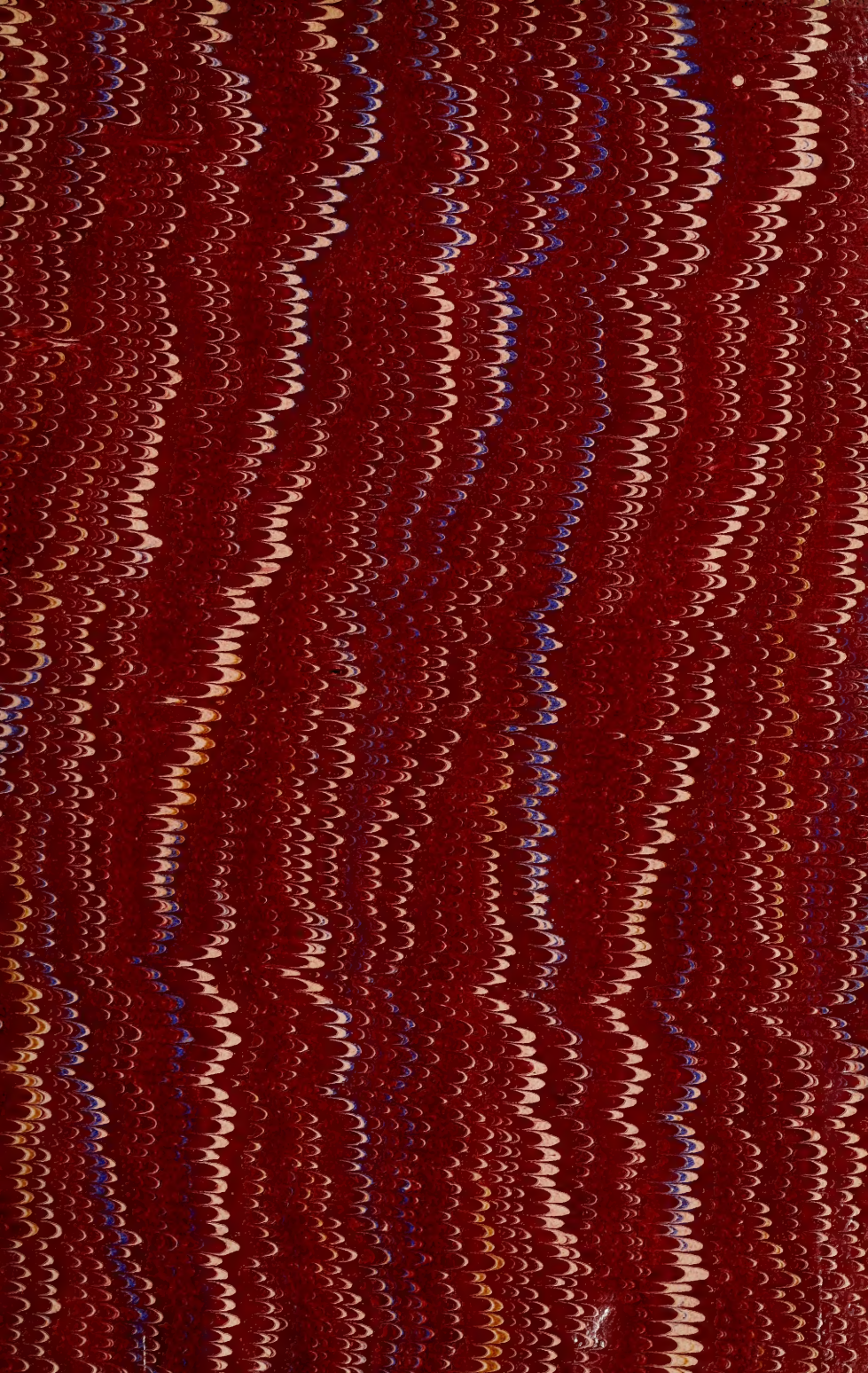
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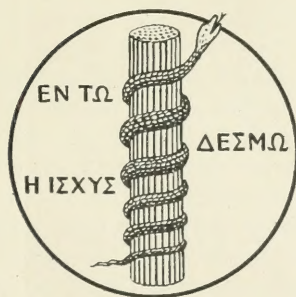
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EDINBURGH MEDICAL JOURNAL.

EDITORIAL NOTES AND NEWS.

The National Insurance Bill.

It was with considerable regret that we found ourselves unable last month to deal with the medical aspects of the National Insurance Bill which had shortly before been placed before the country. Our June issue happened to synchronise with the centenary of Sir James Y. Simpson and was dedicated to his memory, and we were anxious to avoid in it anything savouring of polemics.

In the interval that has elapsed our opinions of the Bill have crystallised, its far-reaching effects have become more evident, and in some respects our task has been rendered easier. It is, we believe, true to say that of all sections of the community the members of the medical profession were least likely to be dazzled at first glance by the glamour of the proposals contained in the Bill. To them there was nothing new in the idea of helping the worker for his daily bread to protect himself against the rainy day which sooner or later must overtake him.

It is a matter of history that in the early days of the Friendly Societies' movement in this country the efforts of those who were trying to instil into the minds of the working classes ideas of thrift and the wisdom of making prudent provision against ill-health, were only rendered practicable by the co-operation of the medical profession, who, to help forward a work which daily experience had taught them would be highly beneficial to the community, gave their services on terms which we hesitate to say were charitable, but which were certainly less than commercial. This action, in its origin generous and philanthropic, unfortunately, through the working of various circumstances, not always entirely to the credit either of the profession or of the friendly societies, has in its evolution resulted in a form of commercialism which we have come to know as contract practice, and which has for long been one of the least desirable features of medical work.

The members of the medical profession, therefore, were in less danger than other sections of the community of allowing their emotions to override their reason when they came to consider the scheme of the Government, and, if we may be allowed to say so, their

intimate knowledge of the conditions of life among the classes of workers who come within the purview of the Bill render them peculiarly able to offer intelligent criticism and helpful advice to those who are responsible for its proposals.

Since the Bill was presented to Parliament it has received the most thorough and careful consideration at the hands of the medical profession, and the unanimity with which all ranks of the profession have criticised certain outstanding features of the Bill and the uniformity of the proposals made to rectify what appears to them to be defective have been most striking.

Even the most enthusiastic supporters of the Government's proposals cannot fail to be impressed by the fact that a body of men so heterogeneous, with such widely different interests individually, and so notoriously prone to differ, should, with a unanimity which is unprecedented, have agreed on a broad and clearly defined line of policy.

The real success of such a scheme depends on the provision of a thoroughly sound and efficient medical service, and, the question of charity being no longer in the field, this can only be obtained by offering a fair, reasonable, and equitable remuneration, and conditions of work which can be tolerated without loss of self-respect. This is essential alike for the insured and the insurer. The vast majority of the insured are honestly desirous of speedily regaining that degree of health and strength which will enable them to resume their daily labours, and the insurers—in this case the State—are equally anxious that the period of disablement should be as brief as possible. To this end the services of well-qualified and reputable doctors is essential.

The question therefore appears to us to resolve itself into this: "On what conditions can the State secure the best available medical service?"

The two great bodies who together may be taken to represent the whole medical profession have endeavoured to formulate an answer to this question.

The General Medical Council, composed as it is for the most part of members of the profession who cannot individually be affected in their status or emoluments by the provisions of the Bill, and who were therefore able to take a more detached view of the situation, offered for the consideration of the promoters of the Bill the following recommendations:—

- (1) That (a) the Insurance Commission,
 (b) the Advisory Committee,
 (c) every Local Health Committee,

should include members who are duly qualified medical practitioners.

- (2) That "medical benefit" and "maternity benefit" should be administered by the Local Health Committees, and not by "approved societies."

(3) That in respect of the administration of "medical benefit," the "arrangements with duly qualified medical practitioners" made by the Local Health Committees should be such as to admit of free choice of the medical practitioner on the part of the insured person; and that in respect of the administration of "maternity benefit," the like free choice of medical practitioner or midwife on the part of the person receiving "maternity benefit" should be admitted.

(4) That in respect of the grant of subscriptions and donations to hospitals and other charitable institutions, contemplated in Clause 17 of the Bill, the governing conditions should be assimilated to those set forth in Clause 15 (1) with regard to the administration of "sanatorium benefit."

(5) That in respect of the provision to be made for "the supply of proper and sufficient drugs and medicines" under Clause 14 (2), the supply of proper surgical dressings and appliances should be included; and further, that steps should be taken to ensure that the drugs and medicines are of the standard required by the *British Pharmacopœia*, and that the dispensing of prescriptions is carried out by qualified persons.

(6) That "medical benefit" should include provision for consultations and for operations when these are necessary.

(7) That, in the case of an insured woman, it should be made clear that "sickness benefit" accrues in addition to "maternity benefit"; and further, that in cases attended by a midwife the Local Health Committee is empowered to pay for the attendance of a medical practitioner, should such attendance be called for by the midwife in accordance with the rules governing her practice.

(8) That in Clause 59 (7), applicable to Ireland, it should be made clear that "deposit contributors" are not limited in their choice of medical practitioners to the Medical Officers of Health for dispensary districts.

The British Medical Association, which may be taken to represent the great body of doctors actively engaged in general practice, as well as others, made representations on almost identical lines. They further laid emphasis on the importance of restricting the benefits of the Bill to workers whose weekly wage was not more than two pounds, and *ipso facto* of eliminating entirely the class of "voluntary contributors." That the opinions expressed by these two differently constituted bodies are shared by the great bulk of the profession in the United Kingdom has been abundantly proved at numerous meetings, and by a plebiscitary expression of opinion taken by the British Medical Association.

We had hoped from the attitude taken up by the Chancellor of the Exchequer when he met the representatives of the Association, and from various indications given by his public utterances in the House of Commons and elsewhere, that these recommendations would have received his favourable consideration, but our hopes have been disappointed by the "considered reply" which he addressed to Sir Donald MacAlister, the President of the General Medical Council, on 13th June.

In considering this question, we desire to avoid any ultra-professional attitude, and, above all, to avoid what has been termed the

"trades union" position. With Sir William Turner we agree that "the medical profession can never become a trades union." At the same time, the profession has rights as well as duties, and if our duties are to be performed to the best advantage of the State, our rights must be respected.

The influence of 20,000 members of the medical profession scattered over the United Kingdom may not be sufficient to prevent this Bill becoming law, but the firm and loyal adhesion to a policy which they believe to be just and equitable can prevent the provisions of the Bill from becoming operative if it becomes an Act, and with a full sense of responsibility we express our belief that such a stand would be in the best interests of the sick poor who will come under the provisions of the Act, and of the honour and dignity of the medical profession.

It is unnecessary for us at this date to enter further into a detailed criticism of the Bill. The points at issue are perfectly familiar to all our readers. We need only say that in the demands made by those who for the time being represent the opinion of the medical profession we cordially concur.

Considerations of space prevent us on this occasion from discussing the effects which the Bill, if passed in its original form, may have on medical teaching, on the administration of our voluntary hospitals, on the relations of public health officers to civilian practitioners, and on other collateral aspects of medicine. These matters are receiving the careful attention of those primarily concerned, and we may return to the subject again.

In conclusion, we hope that when the proper time comes the conditions agreed upon by the representatives of the medical profession and the promoters of the scheme will take the form of amendments to the Bill, and that the decisions to which Parliament may come will be incorporated in the Act, and not be left to be adjusted by administrative officers or statutory committees.

**The Insurance Bill and
Tuberculosis.**

THE attention of the profession has been so occupied by consideration of their more immediate relationship to the provisions of the National Insurance Bill, that the clauses dealing with tuberculosis may have received less thought than the matter deserves.

There would appear to be in some quarters an exuberance of delight over the proposal to erect and maintain sanatoriums for tuberculosis throughout the country, as if thereby an effective step would be taken towards the *eradication* of the disease. The Chancellor has been hailed as the conqueror of consumption. His own attitude towards the question, if over-sanguine, is rather more reserved and modest. What he is concerned with, meanwhile, is the *treatment* of tuberculosis in a certain number of workers with a view to remove the most

frequent cause of prolonged invalidity. Following the German model, the Bill recognises that the money grant during invalidity from tuberculosis may be more advantageously used if devoted to specialised treatment than if given directly to the individual. The well-equipped sanatorium affords such treatment, and it is intended that insured persons suffering from tuberculosis shall be transferred as early as possible to the sanatorium. To increase the possibilities of treatment on a large scale, one million and a half sterling will be devoted to the erection of sanatoriums, and one million to their maintenance.

So far, so good. There can be no doubt that a benefit would be thereby conferred on individual workers. But it were foolish to run away with the notion that much is effected towards the *prevention* or *eradication* of tuberculosis.

Not to speak of the inadequacy of provision under the Bill for the present needs of workers, there will at once arise difficulty and confusion in relation to applications from unsuitable patients—cases in advanced stages of disease. If there be one thing clearer than another it is that the significance of the sanatorium is comparatively slight in the way of effecting a lasting cure, save when treatment has been undertaken at the earliest stage. Even then, six months are generally necessary if the result is to be conceived as permanent. The proposals of the Bill seem to anticipate a much shorter period. Otherwise the proposed provision for the present number of affected persons will be found inadequate. That being so, what is to be done for the large number of more advanced cases—a number daily added to by patients who slip back after apparent cure?

The Chancellor is concerned primarily with invalidity, and, in so far as the sanatorium is able to overtake cases of tuberculosis, benefit will accrue to the individual both physically and economically, and to the community in like manner. But it cannot be emphasised too clearly that the *eradication* of tuberculosis will be affected thereby in small degree only. To be effective in this direction the outlook must be vastly wider. The sanatorium covers but a corner of the field.

Tuberculosis is an infective, endemic disease, most protean in manifestation. Its propagation is dependent on conditions of prolonged compulsory environment, such as are commonly present in all crowded communities. The incidence of tuberculosis is far greater than mortality statistics would indicate.

The anti-tuberculosis problem is a complex one. To meet the various issues a carefully considered and organised plan is necessary. Of chief importance is the direction of attention towards the dwelling. A systematic *search* for tuberculosis must be undertaken in the homes of our people. That is the purpose of the detailed and careful examination of “contacts”—the “march past” of the household—which is a conspicuous feature of the Edinburgh anti-tuberculosis scheme. The

haunts of tuberculosis must be raided. This can only be satisfactorily effected on the lines which the Tuberculosis Dispensary has developed. The ideal of the Tuberculosis Dispensary is the creation of a central institution which concerns itself with every aspect of tuberculosis as it occurs among the poor—a centre for investigation and treatment at the home—a “clearing house” which sorts out the different types of cases, drafting one to the sanatorium, another to the hospital for advanced cases, and so on—a centre of research and a storehouse of facts and statistics regarding the incidence and distribution of tuberculosis.

The Local Government Board of Scotland, recognising the complexity of the problem, took a great step in advance when it pointed out to Local Authorities throughout Scotland the need of, and the possibilities for, such an organised and co-ordinated attack on tuberculosis in every community, and the far-reaching powers already possessed by Local Authorities under existing legislation.

General Medical Council.

THE dust of the Insurance Bill controversy has rather tended to obscure other matters of medical interest, but at its recent session several important subjects were dealt with by the Council.

The most important was a modification of the attitude of the Council to the teaching of physics, chemistry, and biology in schools. This has been the subject of heated controversy for a number of years, and recently the headmasters of certain public schools discussed it in the press with considerable warmth.

We have not space to spare to enter into the whole controversy, but briefly the position is this. Certain licensing bodies—the Universities of Oxford, Cambridge, and London, and the English Conjoint Board—have not insisted on these subjects being studied in a medical school as the Council recommends, and they have therefore not insisted that their students should study for five years *after registration*.

The University of London is in a unique position. It is a purely examining body, and has never over-concerned itself with the curriculum of its students.

Although the Universities of Oxford and Cambridge do not insist on their students being registered within fifteen days of commencing the study of medicine, this has not in any way interfered with a five years' curriculum, for their students all receive a very prolonged and thorough education.

There remains, then, the English Conjoint Board, the chief portal of entrance to the medical profession, which broke away from the recommendations of the Council and permitted its students to appear for final examination, at first four years and a quarter, now four years and a half, after registration as students.

The Scottish and Irish Conjoint Boards allow students to study

these preliminary subjects when they choose, but require five years of study after registration.

By what our lawyers call a back letter a period of fifty-seven months is accepted as the equivalent of five years, so that the difference between the English and the other Conjoint Boards is reduced to three months.

We have again and again advocated this partial recognition of secondary schools, and the form in which the motion was finally adopted (by 24 to 5), under which the Council retains to itself the power of actual recognition, should, we think, prove sufficient to prevent those evils which the dissentients fear.

The report of the Unqualified Practice Sub-Committee, which was unanimously adopted by the Council, contained a resolution urging on the Government the necessity of legislation for the better protection of the public, and offering the assistance of the Council in the framing of measures for the purpose.

The Public Health Committee presented an important report containing some rather drastic recommendations, which it was thought advisable to send down to the various licensing bodies for their comments. We shall deal with this report in a future number of the *Journal*.

The Finance Committee had to report a deficit of £295, 12s. 9d. This was not due to increased expenses but to diminished revenue, the total decrease in fees for registration for the year being £660. It is worth while repeating the figures given, showing how remarkable is the decrease in numbers of those entering the profession of medicine. The average number of students registered in 1886-90 was 1927, and this has steadily diminished, until in the last quinquennial period it reached 1126. The average number of practitioners registered in 1891-5 was 1455; in 1906-10, 1117. Out of every hundred students registered, eighty eventually reach the Medical Register.

Disciplinary Cases. At the last session of the General Medical Council, the medical penal cases were five in number. The names of two medical men were removed from the register in consequence of their having been convicted—one to penal servitude, the other to hard labour.

In three cases practitioners were charged with having been guilty of "infamous conduct in a professional respect." The charge was found proven in all; in two the names were removed from the register. All these cases present a feature in common, namely, that the charge arose in consequence of the practitioners being associated with unqualified persons. Public opinion has been considerably excited, in one case especially, by the decision of the Council. In order to remove any misconception which may have arisen, it will be well to point out the powers under which the Council acted.

The General Medical Council was constituted by the Medical Act of 1858. The preamble of the Act is: "Whereas it is expedient that persons requiring medical aid should be enabled to distinguish qualified from unqualified practitioners: Be it therefore enacted . . ." By the Act the Council was empowered to remove from the register the name of any medical practitioner who shall, after due inquiry, be judged to have been guilty of infamous conduct in a professional respect. The meaning and scope of the verdict of the Council, "infamous conduct in a professional respect," has been defined by the Court of Appeal as follows:—"If it is shown that a medical man in the pursuit of his profession has done something with regard to it which would be reasonably regarded as disgraceful or dishonourable by his professional brethren of good repute and competency, then it is open to the Council to say that he has been guilty of 'infamous conduct in a professional respect.'"

In the cases under consideration disgraceful may be taken to mean not disgraceful in the technical sense, but disgraceful in the sense of ignoring the duty which a member of the profession owes to the community at large. The Council, in virtue of the powers which have been entrusted to it by the Medical Act, is expected to prevent registered practitioners from associating themselves with those who are not on the register.

We propose to consider the cases in the order in which they were heard.

In the first the complainants were the Institute of British Dentists. A medical man was charged with having on various occasions assisted a person not registered as a dentist in carrying on practice as a dentist by administering anaesthetics on his behalf to persons coming to him for treatment. The practitioner stated in his defence that he was not aware there was anything wrong in what he was doing, neither did he remember getting a notice issued from the Council's Office in 1909 of various things a practitioner might not do. He asked the Council to accept his sincere apologies for the breach which he had committed, and gave his unqualified undertaking to abstain from such a breach in future. The Council found the facts proved: judgment was postponed to the next session, when the practitioner will be required to attend and produce evidence of his good conduct in the interval.

In the second case the Medical Defence Union were the complainants. A practitioner was charged with having on various occasions assisted an unregistered person practising in a department of surgery in carrying on such practice by administering anaesthetics on his behalf to persons coming to him for treatment. The charge arose from evidence given by the practitioner himself in the case of *Thomas v. Barker*. The accused medical man acknowledged having administered anes-

thetics for Mr. Barker for five years, and stated that he realised he had not followed the strict rules of medical etiquette, but he would not give an undertaking that he would not administer anaesthetics in future for Mr. Barker.

The Council directed the name of this practitioner to be removed from the register.

During the hearing of the case, the practitioner, in extenuation of his conduct, dwelt upon the skill of Mr. Barker and asked the Council to delay judgment until the appearance in one of the monthlies of an article upon bone-setting by a well-known provincial surgeon. The article referred to will be found in the *English Review* for June. It is not a fair criticism of present-day surgery, nor is it conducive towards the welfare of the community. While the skill of the bone-setter is extolled in the highest terms as an exponent of manipulative surgery, the medical profession is attacked for its ignorance of such procedure and for its prejudice in not recognising the methods of treatment adopted by bone-setters.

The writer of the article misses two points—Firstly, that even acknowledged skill on the part of a bone-setter cannot justify the covering of an unqualified person by a registered practitioner. He states that he was present during the hearing of *Thomas v. Barker*, and although he does not mention the fact, he presumably knew that a medical man had been in the habit of administering an anaesthetic for the bone-setter. Secondly, that surgeons are, and have been for a considerable period, cognisant of the value in certain affections of manipulative methods, when based upon a knowledge of the pathological conditions present. It is only such a knowledge which makes it possible to discriminate between what is good and what is harmful, or even dangerous, in the methods adopted by bone-setters, from which methods it will be conceded that surgeons have learned much that is useful.

In the third case the complainants were the British Medical Association.

Three practitioners were charged with having associated themselves in their professional capacity with an institution termed the Sandow Curative Institute, which systematically advertises for the purpose of procuring patients who are to receive, either by correspondence or by attendance at the said Institute, treatment for disease under the personal direction of Eugen Sandow, who is not a registered medical practitioner, and that they had approved of and acquiesced in such advertising.

At one time Mr. Sandow held himself out as simply an expert in physical culture. Since 1907 the term Curative Physical Culture has been employed, and by numerous books (twenty-four in number) and otherwise, the Institute has systematically advertised its treatment as a cure for disease. The accused practitioners acknowledged that they

were employed by Sandow, Ltd., as medical officers, and stated that their duty consisted in examining intending patients in order to ascertain their fitness or otherwise to undergo the Sandow treatment. The treatment given at the Institute rested entirely with Mr. Sandow. If a patient became suddenly ill during the treatment he was attended by one of the medical men, who gave their whole time to the Institute. The Council found the facts proved. The senior medical man, who had been associated with the Institute since 1907, was judged to have been guilty of infamous conduct in a professional respect, and his name was removed from the register. In the case of the other two practitioners, who were subordinates, judgment was postponed to next session when they will be required to be present and to produce evidence of their conduct in the interval.

The counsel who defended the practitioners laid stress upon the fact that medical men were associated with institutions that advertised in the medical and lay press, and mentioned various sanatoria and hydropathic establishments. The real point at issue in the case was not that the medical men associated themselves with an institution that systematically advertised, but that they associated themselves with an Institute that persistently advertised for the purpose of procuring patients who were to receive treatment for disease from an unregistered person either by attendance or by post.

This case has attracted considerable attention. A certain section of the lay press has hurled invective at the General Medical Council, while another has adopted a more temperate and judicial tone and has supported the action of the Council.

Advertisement is the spirit of the age, and the public too ready to be attracted by its blandishments. Advertisements of secret remedies (the composition and value of which have recently been laid bare) cover hoardings and fill newspapers. There is no profession which lends itself so much to being exploited by advertisement as that which has to do with the healing of the sick, and it is not always easy to draw a line between what may be regarded as legitimate advertising, if there is such a thing in medicine, and that which cannot be tolerated.

Let us suppose that every new medical discovery was exploited for profit instead of being made public for the benefit of the whole of mankind. If the medical profession were allowed to become "commercialised" common advertisers, would not such a state of affairs be most disastrous to the community at large? If medical advertising were condoned by the authority whose duty it is to maintain the standard and efficiency of the profession, a door would be opened to unrestricted commercial competition among medical men.

We have already pointed out that the State imposed upon the Medical Council powers to enable the public to distinguish between the qualified and the unqualified. That body has gradually, in the

interests of the community, stamped out the employment in practice of unqualified assistants ; covering as it was met with, *circa* thirty years ago, is becoming a thing of the past ; reputed skill, however great, is no justification for the offence. If it were, a flood-gate of unqualified practice would be opened. Notices are from time to time issued from the Medical Council Office as to things a medical man ought not to do.

The weaker brethren in the profession ought to know that they are not to yield to the temptations which arise during the course of their professional work. The lesson to be learned from the cases which we have reviewed is a very simple one—the association of qualified medical men with the unqualified is unprofessional.

J. T. T. ALTHOUGH Tatham Thompson had been away from Edinburgh for a long time, he will be well remembered by what is now becoming the older generation of Edinburgh men as one who was constantly to the front in all acts and ceremonies of good fellowship, and whose facility with his pencil and brush made him a valued cartoonist on the Liberal side at rectorial elections. Many of his drawings at these times are still treasured by those who fought alongside him. He turned his powers also to more serious use in medical illustration, and practically all the illustrations to Woodhead's *Practical Pathology* were done by him. Ophthalmic surgery was a specialty well suited to his delicate fingers, and at the time of his death he was Consulting Ophthalmic Surgeon to the Cardiff Infirmary, and Surgeon Oculist to the South Wales Institute for the Blind. He wrote many valuable papers, and for many years enjoyed a large ophthalmic practice.

[The following letter addressed to Sir Alexander Simpson was received too late for insertion in the Simpson Centenary Number published last month.]

REMINISCENCES OF J. Y. SIMPSON.

HOTEL BRIGHTON, ATLANTIC CITY, N.J.,
22nd May 1911.

MY DEAR DOCTOR SIMPSON,—

Yours of the 6th inst. has reached me here on my way home to Newport from several months in Florida. As with many other kind letters I have had from you during nearly half a century, it has again reminded me of the happy period that I spent as almost a member of your uncle's household. A reminder as to how this came about may still interest you.

In 1846 surgical anæsthesia was realised in Boston, at the Massachusetts General Hospital, where it was rendered effective, being then, as ever subsequently, a virtual appendage of Harvard University, at which in 1847 I matriculated as a student. My father was at the time one of the physicians of the hospital. For this reason I was permitted prematurely to attend the operations thereat in advance of my graduation in medicine in 1853. Though I was not present at the very first ether cases, I saw a great many of the early later ones, and was privileged to be present, as assistant, during 1851 to 1853, at perhaps most of the private surgical work of two of the most prominent surgeons at the hospital, Doctors Henry J. Bigelow and J. Mason Warren. Therefore from the outset I was trained to believe in the superexcellence of sulphuric ether.

Upon leaving for Europe in October 1853 it was my intention to spend a couple of years at Vienna, then the Mecca of most young American physicians. For a very curious reason, however, I did not reach that city till twenty years later—in 1873. In the fifties Professor Simpson was at the head of living gynecologists; indeed he may be truly said to have created this department, as distinguished from parturition and its few peculiar diseases. Appreciating this fact, and even then intending to make gynecology my eventual specialty, I did not dare hope for more than a mere glimpse of so great a man. Just before sailing, my preceptor in obstetrics, Dr. Walter Channing, who had visited Professor Simpson, and had written a large work upon *Etherisation in Childbirth*, asked if I would not like a letter of introduction to him. You

can conceive my elation at this, and my subsequent chagrin upon finding that the letter commended me as "an enthusiastic student in natural history." Channing knew my real wish, but even then the intense jealousies of the ether-chloroform controversy were having their effect upon the Boston mind. My first impulse, fortunately not yielded to, was to destroy the letter, in utter disbelief in its possible usefulness. Having progressed towards Vienna as far as Venice, an accident to my travelling companion induced me to change my route, and after visiting hospitals in Paris and London, and finding myself so near to Edinburgh, I went thither, as I supposed, for merely a day or two. Bethinking of the Channing letter, I called at 52 Queen Street, with very little anticipation of what was there to occur.

Passing a great staircase, which many grand ladies were ascending, and through a hall filled with poor women, I was shown into a spacious library, around which were waiting a number of anxious husbands and physicians who had brought patients. At a desk in the centre sat a most attractive young secretary, the future Sir William Overend Priestley, a relative of the famous chemist, and who himself was to become so distinguished a gynaecologist in London. This gentleman received me most cordially, and the friendship, soon to become so close, remained unbroken until his death. Presently the professor came down from above, hastened from one to another, and then opening Channing's letter, said, "My friend mentions that Dr. Storer is greatly interested in natural history. Now, there is but little of that sort of thing in Edinburgh. My time is very limited, but for the next day or two I will try to show you what there is. What branch do you care most for?" I replied, "The diseases of women." "Oh, ho!" he said, "that's wholly a different affair. Come upstairs."

He then took me into a little chamber adjoining his own central consulting-room. A lady was lying upon a couch. "She is the wife," he said, "of a very prominent clergyman in New York. Examine her. I will return in fifteen minutes, and you shall tell me her disease." I was greatly embarrassed, and so was the lady, but she said that in that house all must do as the professor commanded. He returned, and I acknowledged my utter ignorance. He replied that I was so far right, for he had himself seen but one similar case. Taking me into another chamber, I thought that the lesion here might probably be so and so. "Wrong, but yet very near the truth." Regarding a third patient I ventured a positive diagnosis, was this time right, and invited to breakfast next

morning. Thence I gradually advanced day by day, through the professor's great kindness and patience, until he admitted me to full assistantship with Priestley, in charge of his private cases, even of the greatest importance, and his house became to me a second home.

I have spoken at length of this episode as showing how greatly a mere word, in season, may change a man's whole life.

Of Dr. Simpson himself, his leonine personality, his goodness to the poor, his tenaciousness of views that his experience had proved correct, his courage, his hatred of wrong, his deep religious belief, the world knows of all these. I could instance, from my own personal knowledge, a thousand examples. Better, however, that I, an old man, in my eighty-second year, should speak of matters of more general and important bearing.

Upon my leaving Edinburgh at the close of 1855 Dr. Simpson urged me to settle permanently in Glasgow, thinking, of course, that I might be of aid in the care of his even then very large number of American patients. I decided, however, to return to Boston. His parting gift, interesting in regard to much that afterwards occurred, was a solid gold ink-stand, studded with Scottish jewels. Many a night I had sat for hours at his bedside writing from his dictation much that till then he had not published, and there was nothing, he now said, that could more appropriately bring his teachings to my mind and transmit them to others than a receptacle for printer's ink. For this there at once came the need.

From the very beginning of the ether-chloroform controversy in 1848, and even now, the name of Simpson has been anathema in Boston. Immediately after 1846 the profession was in a ferment regarding the rival claims of Morton and Jackson—the one a seeker for an agent for surgical insensibility to pain, and the other the suggestor of sulphuric ether—both subsequently quarrelling, and each claiming exclusive merit. No one who was not upon the spot can have the slightest idea of the professional rancour and virulence that prevailed. Into this turbulent camp, like a bomb, came the announcement of chloroform, and not unnaturally, and in self-relief as it were, even if we eliminate the national features of the case, the adherents of both great contending factions turned, as one man, against Simpson. Their sons and their sons' sons have inherited the unkind feeling, just as occurred in the Harvey and Jenner, and a great many other colossal professional controversies.

The Massachusetts General Hospital has had its semi-centennial celebration, with great pomp and ceremony, of the discovery at Boston, and in that hospital, of surgical anæsthesia, and thereat sulphuric ether was lauded as the one only safe and justifiable agent. The coming centennial jubilee will doubtless be still more imposing. Could it have been that the real and essential heavenly boon of anæsthesia could alone have been considered, Boston and Edinburgh would have joined hands in fraternal clasp, and the names of John C. Warren, who first dared give ether in a capital operation, and of Simpson, who imperilled his own life when testing chloroform, would have been linked together for all time.

Long before the discovery of anæsthesia Dr. Benjamin Rush, "The American Sydenham," foretold that an agent would eventually be found to cancel the anguish of labour without in any way interfering with normal uterine contraction. This prophecy, as I have shown (*Journal of the American Medical Association*), seems to have escaped Simpson's almost boundless research. Otherwise he would have been sure to have followed the clue till its secret had been revealed. Had Edinburgh been the recipient, we may be sure that while general anæsthesia would have been lauded to the skies, Scottish good fellowship would have fairly treated every successive improvement. Unlike the spirit of the existing monument to Ether alone, the words suggested by Boston's generously-minded poet physician, "To Either," would have been inscribed, and the best of all anæsthetic agents have been allowed peaceably to win.

In Boston, and wherever in America the teachings of Boston and Harvard University have extended, the use of chloroform is still practically forbidden. Elsewhere in this country, as in all others of the world, its many special advantages, particularly in midwifery, are of course recognised. Very early in the controversy I endeavoured to state these in papers in the *Boston Medical and Surgical Journal*, reprinted under the title of *Eutokia*. In consequence, though Boston born and bred, in practice there for many years, and a Harvard man at that, I was myself put under the ban—overjoyed, I need not say, to find myself in such good company. Simpson was very unjustly and most strangely accused in Boston of having by implication, if not directly, claimed the whole credit of the discovery of anæsthesia. His very last public words were in reply to Dr. Jacob Bigelow, who brought me into the world, and who was one of my preceptors at Harvard. From his death-bed Dr. Simpson sent me the proof-sheets of this paper,

corrected by his own hand, and not long ago I transferred them to the great medical library connected with the United States Surgeon-General's office at Washington, as the place much more certain than Boston of their being prized and reverently preserved.

Aside from the chloroform controversy, Simpson's fame as a gynaecologist was secure. Before him, in America, a Ferguson's speculum and lunar caustic, with watch spring and globular pessaries, constituted the gynaecological armamentarium. At his death the American Medical Association was in session in Washington. A telegram from his son reached me within an hour afterwards. Upon communicating it to the Association that body at once adjourned, and to add still greater honour, it held a special memorial meeting, at which many of the most noted physicians in America were present and took part. This appreciation was of the gynaecologist even more than of the anaesthetist. At almost every one of the American colleges Simpson's teachings, as such, are perpetuated. There is, however, one great and marked exception. The Medical School of Harvard University has been, and is still, prominent in its neglect of everything pertaining to gynaecology. In every other department there are professors, assistant professors, and instructors, almost without number. Here gynaecology is practically placed at the bottom of the list. It will be said that disapproval of chloroform has had nothing to do with this virtual boycott. The coincidence, however, is not undeserving comment.*

Of my own stewardship but a word need be said. Simpson had committed to me and to Priestley for publication his collected, and also till then unwritten, contributions to obstetrics and gynaecology. They appeared first in Edinburgh and afterwards in Philadelphia. Repudiated in Boston, I there for twenty years defended them at the sacrifice, as it proved, of all my chief personal ambitions. Incurring septicæmia through over-fatigue of body and mind, I subsequently removed to the physically and intellectually more genial climate of Rhode Island, and have here received for more than thirty years, and without a single exception, the sympathy, approval, and most generous co-operation of its entire profession. Chloroform is not here a chimæra dire, and Simpson's memory is beloved. It is possible that the trying east

* Possibly my remarks regarding the Harvard Medical School, with its present immense resources, may be somewhat overdrawn, for I am not familiar with its latest curriculum, but they are certainly true of the neglect of gynaecology at its great hospital, at which both myself and my son were educated.

winds of Massachusetts Bay did much towards hardening the temper of the old Boston Puritans and cruelising them. I have long thus explained to myself the course of its etherists. Almost all of them who were my contemporaries are now dead. Before long I must join them, and I am looking forward with much humorous interest to see whether it will be the hand of fellowship or the still averted countenance that will then greet me.

Of Simpson's other assistants, men without exception of remarkable ability in their chosen field, I could say much had I the vigour to do so. Keith I knew fairly well, and also Drummond, whom I saw somewhat of at Nice, as of Lachlan Aitken at Rome. Lawson Tait and Matthews Duncan were correspondents of mine, but it was Priestley, the genial and always self-sacrificing, who was my intimate friend. He felt with me, and with no slavish subserviency to our dear master, that to have merely been one of "Simpson's men" was the very highest professional privilege and honour.—Yours, etc.,

HORATIO R. STORER.

THE DIAGNOSIS OF CALCULI IN KIDNEY AND URETER BY MEANS OF THE X-RAYS.*

By GEORGE A. PIRIE, M.D.,

Honorary Medical Electrician to the Dundee Royal Infirmary, &c.

THE importance of an X-ray examination of the urinary tract in cases of suspected calculus is now acknowledged by all. About six years ago Mr. Hurry Fenwick¹ prefaced a lecture to a post-graduate audience by these words:—"Before the routine employment of expert radiography in cases of renal pain, the diagnosis of stone in the kidney and ureter was merely speculative. The clinician was rarely certain as to whether a stone was present or not, or, if he was assured in his own mind that a calculus did exist, he could not say whether it was imprisoned in the kidney or whether it had passed into and had become arrested in the ureter, so similar are the symptoms evoked by stone in either position. The surgeon was forced, therefore, to explore first the kidney and then the ureter before he could declare the patient free from stone. Expert radiography has, however, entirely altered the character of the diagnosis, and has modified the operative procedure." Again, three years later, he² wrote:—"One of the most distressing failures in urinary surgery consists in the operator cutting into a kidney and mutilating it, perhaps irreparably, in order to find a stone which has long ago left that organ and travelled down the ureter."

Last year, in a lecture on Ureteral Calculi, Mr. Sinclair White³ said: "The routine procedure *was* to explore the kidney and then to search the ureter by means of a long flexible probe passed downwards from the renal pelvis. The Röntgen rays have altered this."

With these preliminary quotations let me now explain the *method of examination* adopted in the Dundee Royal Infirmary and show some of the results.

The patient lies, face downwards, on a canvas-covered couch. The X-ray tube is underneath. The fluorescent screen is laid on the patient's back. He is now ready for the screen examination, which is done first in every case.

Some observers dispense with this as unnecessary and dangerous, but I have found it of great assistance in locating a stone

* A paper read before the Forfarshire Medical Association, 6th April 1911.



FIG. 1. Miss A. B., aged 25, had left lumbar pain for 16 years; 1 calculus in left kidney removed by Professor Macewan, August 1909.

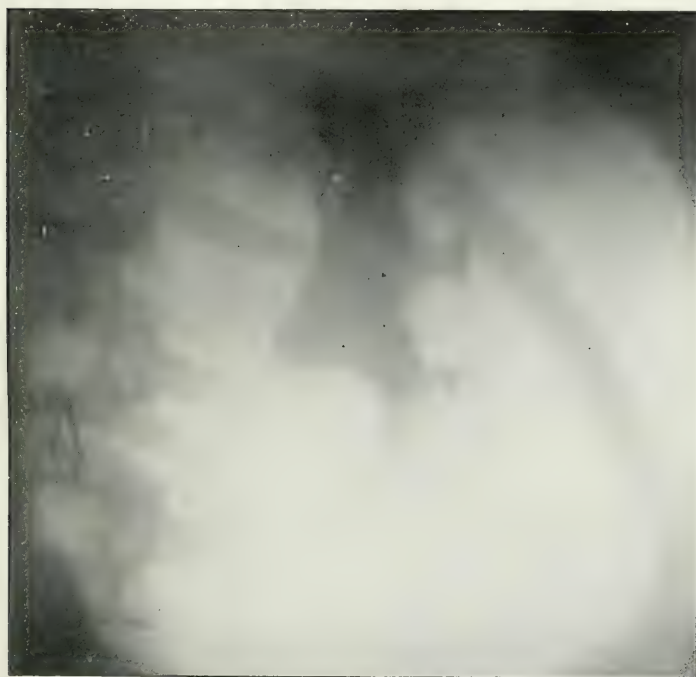


FIG. 2. J. M.G., aged 32, had right lumbar pain for 10 years; 1 large calculus and 2 small ones in pelvis of right kidney removed by Professor Macewan, September 1909.



FIG. 3. Mrs. M'K., aged 43, had left lumbar pain for 8 weeks. Many calculi in left lumbar region, removed by Mr. Price in January 1911. Pyonephrosis present.

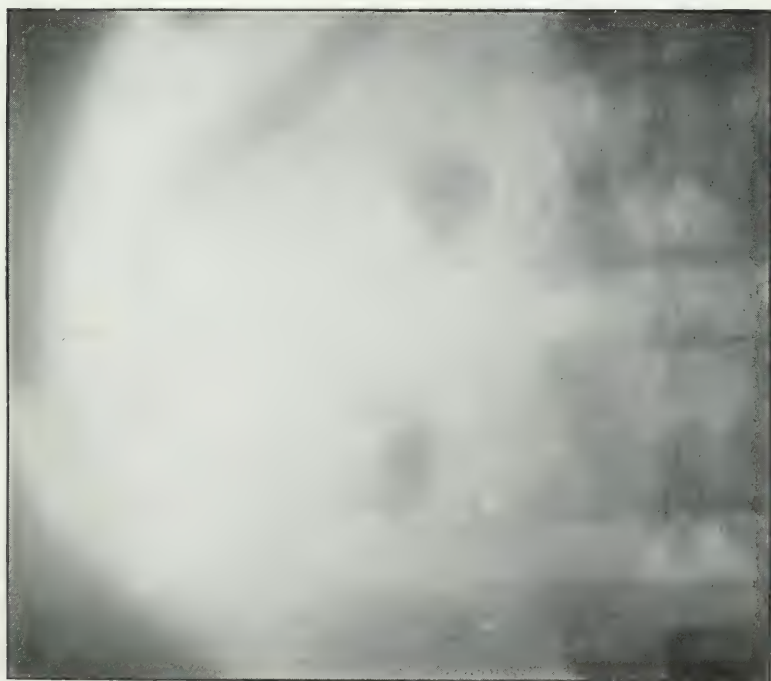


FIG. 4. Mrs. R., aged 41, had pain in bladder for 6 months; 2 shadows of calculi in left kidney and ureter removed by Professor Macewan, January 1911; one, dumb-bell shaped, in pelvis



FIG. 5. G. H., aged 34, had right lumbar pain for 4 days; 2 shadows like calculi in right $\frac{1}{2}$ inch of ureter. Operation, January 1911. No calculus present; 2 calcified mes-enteric glands found.



FIG. 6. J. S., aged 43, had left lumbar pain for 3 days; shadow, like calculus in left ureter, lower end. Operation, January 1910. No calculus found.

for subsequent radiography, and if proper care is taken there is no danger either to patient or operator.

The lights in the room are now put out and the X-rays turned on. A rapid survey of the whole urinary tract is then made. If a doubtful shadow is detected, the diaphragm opening is reduced and a careful examination is made of its position and shape and movement during forced respiration. Then a sensitive plate in its red and black envelopes is slipped under the screen and exposed for a minute. Recently, by the adoption of an intensifying screen placed next the film, the time of exposure can be reduced to fifteen seconds, while the patient holds his breath. The plate is then developed and a permanent record of the shadow is thus obtained.

If no abnormal shadow is visible, a careful examination is made with the diaphragm opening reduced to a square inch or less, and the whole urinary tract is gone over by moving the X-ray tube under the couch and following the spot of light with the screen. If, after all, no abnormal shadow can be detected by screen examination, it is very unlikely that a plate would show any, and the diagnosis of no stone is given. Sometimes in cases where the symptoms are very suggestive of stone a plate has been taken, but the result is invariably negative.

The value of this examination depends greatly on the observance of three rules:—(1) The patient's bowels must be well cleared; (2) the lamp must be of the right degree of hardness; (3) if a radiogram is taken, the respiratory movements must be stopped during the exposure of the plate. The reason for these rules is evident. If the bowels are loaded, there will certainly be vague shadows to obscure stones or even to be mistaken for them. If the lamp is too soft the X-rays will not penetrate the abdomen, and if too hard they will pass through calculi without casting much shadow. If a photograph is taken during respiration the shadows are very apt to move and cause a vague streak on the plate or no mark at all.

Now a word as to the *results*. I would place them in three classes:—I. Where there is no doubt that a stone is present; II. Where there is no doubt that no stone is present; III. Where shadows are seen, whose meaning is doubtful.

Those in the first class are the most striking and the most satisfactory. Frequently a single stone has been observed in kidney or ureter, and its removal has led to entire relief of all symptoms; or, again, there have been many calculi or one large and branched,¹

or one calculus with much calcareous debris. In these cases nephrectomy has been done, but the results are not so favourable. In one curious case the kidney was seen to be full of stones, but the patient said they caused him no trouble and he declined operation.

The second class is the most numerous. Nearly 300 cases have been examined when lumbar pain was the prominent symptom and no calculus could be seen. In one of these an operation was performed, with negative result.

The third class contains the most puzzling cases. A shadow is seen which is peculiar in shape, or position, or movement, and the diagnosis of stone is only suggested as a possibility, for there are seven other things which might cause it:—(1) Some dense material in the intestine; (2) a calcareous mesenteric gland; (3) a concretion or foreign body in the appendix; (4) a phlebolith; (5) a calcareous patch on a vessel; (6) an ossification of a ligament; (7) a scar in the kidney or elsewhere.

I shall not attempt to discuss the differential diagnosis of each of them. In one a purge settles the question, in another the appearance and range of movement are conclusive, but in some the diagnosis remains doubtful. Indeed the interpretation of these shadows is yet in its infancy, and one observer has remarked with much truth that the frequency of shadows in a normal pelvis comes to be a positive nuisance.

Let me conclude by quoting some rules laid down by Mr. Thurston Holland⁵ for a radiographer to adopt before sending any case to a surgeon:—(1) Have the case examined at least twice to confirm the diagnosis; (2) examine it, if possible, on the day of operation lest the stone has moved; (3) examine the whole urinary tract in every case.

The non-observance of these rules has led to some unnecessary operations, but, after all, the words of Mr. Hurry Fenwick may well sum up the matter: "Let us admit many failures, some fallacies, and very decided limitations for the X-ray; but let us employ it routinely when it is possible, and control its findings by operative work."

REFERENCES.—¹ *Brit. Med. Journ.*, 17th June 1905, p. 1325. ² Hurry Fenwick, *Radiography*, p. 51. ³ *Brit. Med. Journ.*, 1st January 1910, p. 1. ⁴ *Brit. Med. Journ.*, 7th May 1910. ⁵ *Proc. Roy. Soc. Med.*, Electro-Therap. Section, 18th February 1910, p. 87.

ON THE DIAGNOSIS OF URINARY CALCULI BY MEANS OF THE X-RAY.*

By EDMUND PRICE, M.B.,
Radiologist, Chalmers's Hospital, Edinburgh.

DURING the past three years 143 cases of possible urinary calculus have been sent to me for examination. In 102 of these a negative diagnosis was made, and as showing the value and reliability of even a negative diagnosis, it may interest my readers to know that five of the patients suffered from severe and even dangerous hæmaturia, accompanied by persistent or intermittent pain. One proved to be a case of hæmophilia. The second, a man 31 years of age, died from what turned out to be a rapidly growing malignant tumour of the left kidney. The third patient died suddenly in hospital from cerebral hæmorrhage, and one may safely infer that he also had hæmorrhages into his kidneys which accounted for the hæmaturia. In the case of the fourth patient the kidney was incised, and a bougie passed down the ureter into the bladder; no stone was found. The patient made a good recovery, and the hæmaturia ceased. In the fifth case the kidney was removed and a simple papillomatous tumour was found growing from the inner wall of the pelvis. Here, too, the patient made a good recovery, and the hæmaturia ceased.

Included in these negative cases are a number in which, owing to the presence of other conditions which cast shadows closely resembling those of urinary calculus, a definite diagnosis could not be made by the X-ray. These I shall return to later.

Of the forty-one cases in which a positive diagnosis was made, in thirteen of them no operation, so far as I am aware, has as yet been performed. In five—four of ureteric and one of vesical calculus—the stones were passed *per viam naturalem*, leaving twenty-three cases which went on to operation; in two of these no stone was found.

The cases I have enumerated resolve themselves into three series, viz.:—Those in which an absolute *negative* diagnosis was made; secondly, those in which an absolute *positive* diagnosis was made; and thirdly, those in which, owing to the character of the shadow, it was found impossible to say *definitely* whether it was

* A lantern demonstration of urinary calculi to the Medico-Chirurgical Society of Edinburgh, May 1911.

due to a calculus or to one of the other conditions, the shadows of which mimic those of urinary calculus, the conditions most frequently giving rise to this difficulty being *phleboliths* or calcareous deposits in the pelvic veins, mesenteric *glands* which have undergone calcareous degeneration, and abnormalities connected with the *appendix*.

In order that the opinion given by a radiologist may be reliable, certain rules of procedure must be closely followed—rules which have been laid down by workers who have had a far wider experience than has, so far, fallen to my lot.

Needless to say, the technique must be good, and result in skiagrams which reveal more than an indefinite shadow of the parts exposed. The tissue markings of the 12th rib and of the transverse processes of the lumbar vertebrae, the edge of the psoas muscle, and even the shadow of the kidney itself, must be clearly discernible.

In every case of suspected urinary calculus a complete examination of the whole urinary tract on both sides must be made. Fig. 1 shows the shadow of a calculus in the left kidney of a lady who suffered from haematuria, and in whom the pain was entirely confined to the *right* side. She came to me direct from the consultant's house. The large intestine had not been emptied. I made a complete examination of both sides, and found the stone on the left side, but nothing on the right. This condition, whilst occasionally met with, is rare. Following my advice she returned after the lapse of a month. The bowels had been thoroughly emptied, and I was able to demonstrate the presence of a calculus in the right kidney (Fig. 2) as well as the one in the left, which had been entirely unsuspected.

A patient was sent to me with the provisional diagnosis of calculus in the *left* ureter. Her right kidney had been incised, fragments of a large calculus had been removed from an abscess cavity, the kidney had been drained, and was out of circuit. I made a complete examination, and, as Fig. 3 and Fig. 4 show, there still remained a fragment of a stone in the right kidney, and there was also present a large calculus in the bladder. The left kidney and ureter were empty. I should like at this point to draw the attention of surgeons to a question which has been put to me more than once, viz.: If it is possible to make an absolute positive or negative diagnosis in the case of vesical calculus by means of the X-ray, why have patients to submit to the "brutality" of having a sound passed into the bladder? I need hardly add that

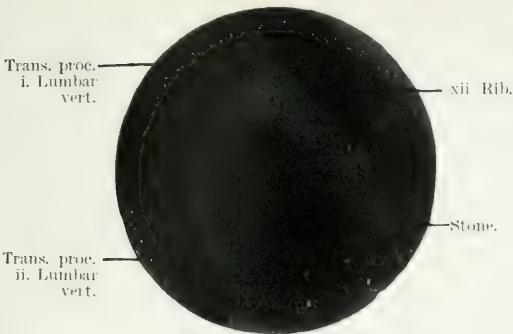


FIG. 1.

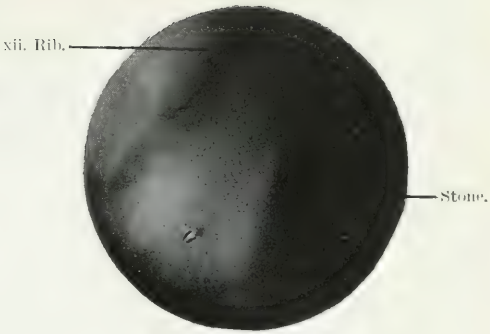


FIG. 2.

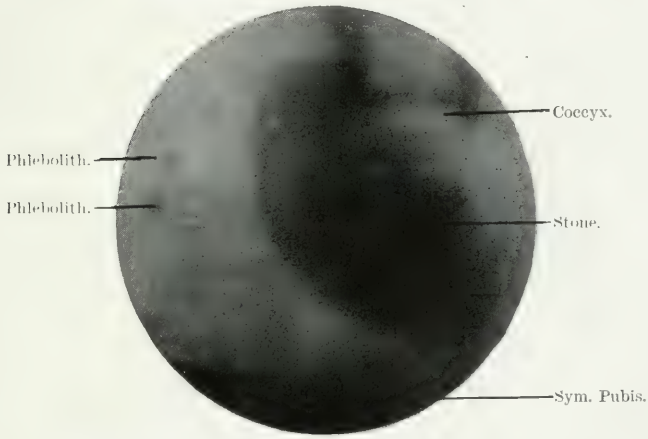


FIG. 4.

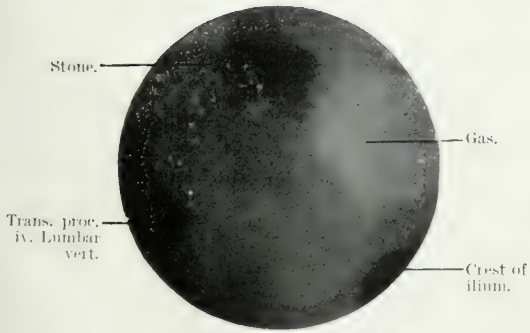


FIG. 3.

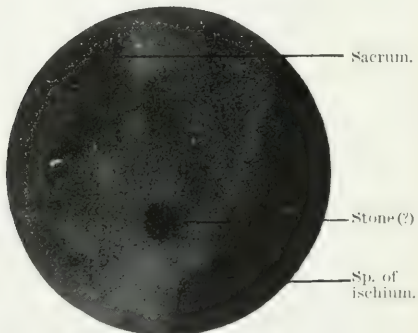


FIG. 5.

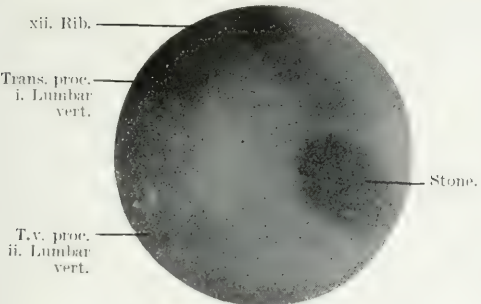


FIG. 6.

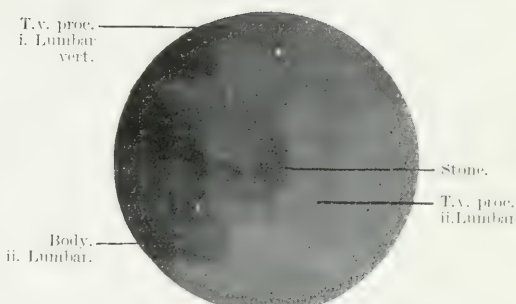


FIG. 7.

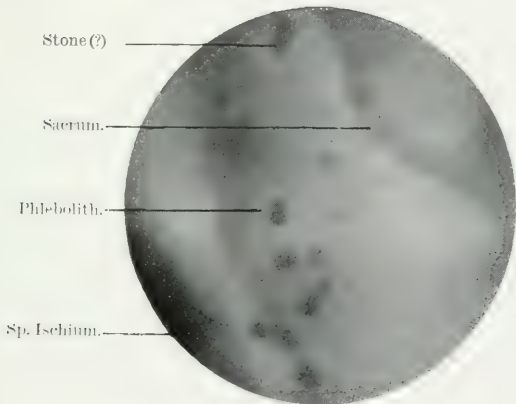


FIG. 10.

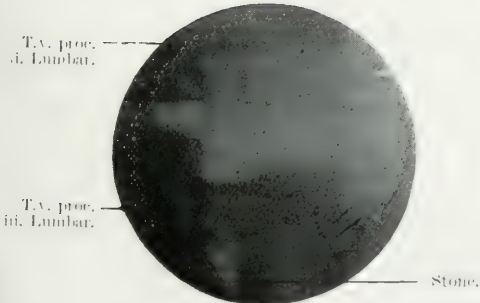


FIG. 8.

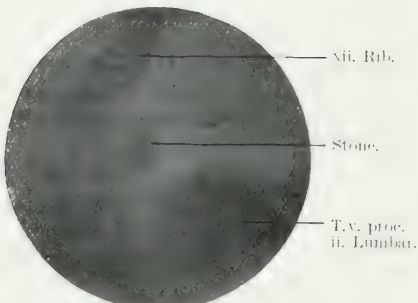


FIG. 9.

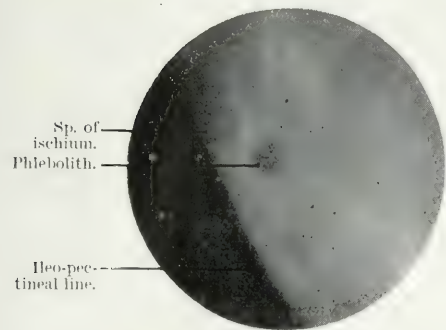


FIG. 11.

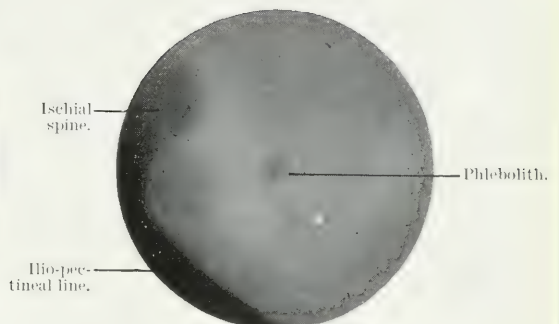


FIG. 12.

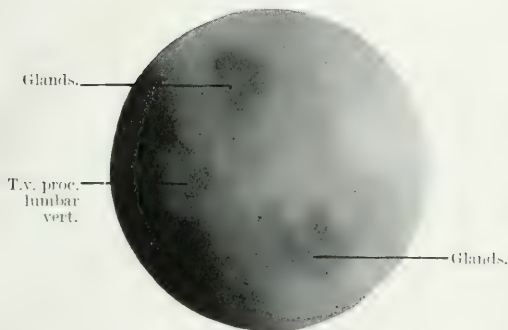


FIG. 13.

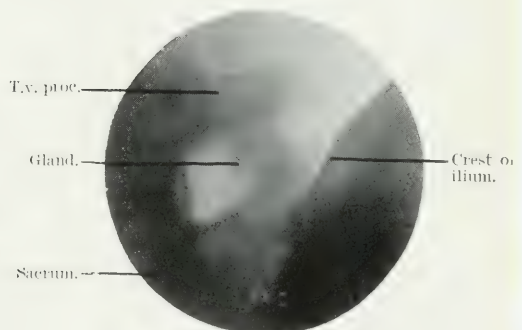


FIG. 14.

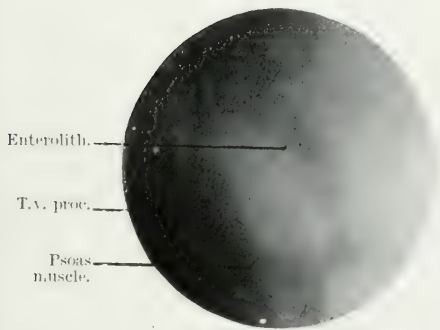


FIG. 15.

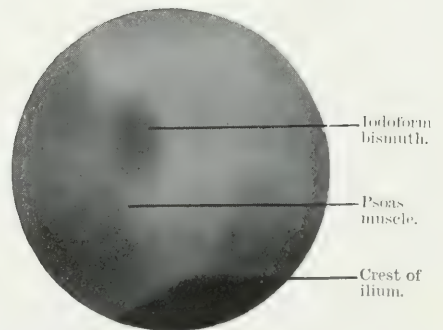


FIG. 16.

in the case I have illustrated—Fig. 4—a sound had not been passed.

Fig. 5, a large round shadow in the neighbourhood of the spine of the ischium on the left side, is from a patient who had suffered for three years from symptoms of urinary calculus. For three months there had been a fixed pain about two inches internal to the left anterior superior iliac spine. The case was sent in as one of calculus of the left ureter. The tube was centred over the painful spot, with the result shown in Fig. 5, but a complete examination having been made, a large calculus (Fig. 6) was found to be present in the left kidney.

The operation was performed two days after the exposure to the X-ray had been made. A calculus, corresponding in size to the shadow, was found in the kidney. A bougie was passed down the ureter and that organ was found to be *empty*.

It may be that the shadow in the ureter region is that of a single phlebolith, or it may be that in the interval that elapsed between the taking of the skiagram and the performance of the operation the calculus had passed on into the bladder.

When dealing with *ureteric calculi* it is of the utmost importance that a control examination be made on the morning of the operation for their removal, because these bodies are liable to travel considerable distances at irregular intervals of time, and it has frequently occurred that an operator has found no stone at the point indicated by the skiagram; and, indeed, as has been pointed out by Dr. Thurstan Holland of Liverpool and Dr. Dawson Turner of Edinburgh, a calculus may travel up and down the whole length of a dilated ureter. Fig. 7 shows a calculus in the left ureter lying across the transverse process of the second lumbar vertebra. A control skiagram was made a few hours before the operation and it was then found to be (Fig. 8) lying below the level of the transverse process of the third lumbar vertebra, a position much more favourable for its removal, as was found to be the case by Mr. Harold J. Stiles, who performed the operation.

Renal calculi, which give rise to severe pain and hæmaturia, are frequently small, flat and sharp-edged, and it is impossible for the surgeon to recognise their presence by mere palpation of the kidney. In such cases that organ must be incised. Fig. 9 is rather a poor print from the skiagram of such a case. Mr. Stiles, who performed the operation, was quite unable to feel the stone by palpation—in fact he expressed the opinion that it would have been well had a control examination been made that morning, inferring

that the shadow was that of a ureteric calculus. Immediately on making an incision, however, and introducing his finger into the kidney wound, he came upon, and removed, a small, flat, sharp-edged stone about the size and thickness of the nail of the little finger.

Turning next to that very important and troublesome series of cases, in which it is difficult or impossible for the radiologist to give a definite opinion, we find that the most frequent cause of difficulty is the presence of *phleboliths* or thrombi in the pelvic veins which have undergone calcification, and which throw shadows closely resembling those of calculi in the lower third of the ureter. When these shadows are multiple, as in Fig. 10, it is comparatively easy to differentiate between them and those of ureteric calculus, though in the case illustrated Mr. Thurstan Holland—whose repeated acts of kindness and guidance I gratefully and gladly acknowledge—to whom the plate was submitted, was of opinion that probably all the shadows were phleboliths, but that the top-most one *might* be a ureteric calculus.

The difficulty is greatly increased when only a single shadow is found, as in Fig. 11. This is from a young man who suffered for some months from pain of an indefinite character on the right side of the abdomen. The symptoms were not characteristic of appendicitis, and there was no blood in the urine. A skiagram was taken on three different occasions, and the shadow was found to be always in the same position. A guarded negative diagnosis was given. On performing an exploratory laparotomy, Mr. Stiles found a small malignant adenoma growing from the tip of the appendix. On the patient's recovery from the operation a fourth skiagram was taken, and the shadow was found to be in its original position, and was evidently produced by a phlebolith.

Fig. 12 is from a patient, a woman, who had suffered for months from pain of a colicky nature, confined to the left side of her abdomen. She had, in addition, a considerable number of red blood-cells in the urine. After the first examination a guarded negative diagnosis was made. She was sent home, but returned in six months with the pain unabated, and with red blood-cells still present in the urine. A second skiagram showed the shadow to be present in its original position. As the patient was suffering a great deal, and was anxious to have something done, the ureter was cut down upon and found to be empty, but about half an inch external to it a small phlebolith was found and removed. The patient made a good recovery, and returned home completely relieved of the pain and hæmaturia.

Glands in the mesentery which have undergone calcification sometimes give rise to difficulty, not, as shown in Fig. 13, when the shadows are arranged in packets, as pointed out by Mr. Hurry Fenwick, but when, as in Fig. 14, a single shadow is thrown in the direct line of the ureter.

Finally, abnormal conditions of the appendix are apt to cast shadows, which give rise to confusion and doubt.

Fig. 15 is from a lady whose symptoms had baffled a considerable number of medical men. The shadow, taken by itself, might quite well have been mistaken for a calculus in the lower pole of the kidney, but, fortunately for myself, I had made a complete examination, and was able to show two small shadows on a level with, and a little external to, the transverse process of the first lumbar vertebra, and the diagnosis of calculus in the kidney with an intestinal concretion in the appendix was verified by Professor Alexis Thomson, who performed the operation.

Fig. 16 is from a lady who had had her appendix removed two years previous to being sent to me for radiographic examination. The shadow is seen to lie in an unusual position, and does not correspond with the normal line of the ureter. The conclusion I came to, and believe to be the correct one, is that it is thrown by the bismuth and iodoform paste which is usually applied to the stump of the appendix before the latter is invaginated and the peritoneal coat stitched over it.

In conclusion, I regret that some of the radiographs are not as clear as I should have wished them to be; they appear as they came from the printer's frame, and much detail is unavoidably lost in printing.

A NOTE ON HEART STRAIN, NEUROSES, AND MUSCULAR EXERCISE.

By F. PARKES WEBER, M.D., F.R.C.P.,
Physician to the German Hospital, London.

IN the expression "heart strain" I suppose that the word "strain" means "violent action," and, probably, an *excessive* effort made by this muscular organ in order to do the work which is demanded of it. I take it that "strain" in this sense can seldom be good for the heart.* Whether it does harm or not must depend on the degree and duration of the "strain" and the condition (temporary or otherwise) of the individual and his heart. What is "strain" for one person is often an ordinary pleasurable effort for another. The least voluntary muscular exertion may be too much for the heart in some cases, as for instance in the case of a child with myocarditis from diphtheria or in a person chronically poisoned by carbon dioxide owing to laryngeal obstruction; (*e.g.* from laryngeal oedema connected with syphilitic disease, before tracheotomy has been performed). The cardiac valves, soon after apparent recovery from an attack of acute rheumatism, may, as is well known, be in a state which renders them specially liable to damage from strain. Thus, a young member of our profession recovered from a severe illness, probably acute rheumatism, apparently without any cardiac lesion. On recovery he went in for rather violent muscular exercise (sport of some kind), and when I had to examine him, about three years later, when he was 30 years old, for life insurance (in connection with his approaching marriage), I found the characteristic signs of well-marked aortic reflux. The aortic valves had probably been prematurely strained by the sport he indulged in after his illness.

The amount or kind of exercise which constitutes "strain" (*i.e.* "over-exercise") depends of course upon individual conditions. It is quite obvious, for instance, that in cases of chronic cardiac disease with commencing failure of compensation almost any muscular exertion throws a "strain" on the heart, but patients with ordinary compensated valvular disease react to muscular exercise, and often even to "strain," like ordinary healthy

* *Cp.* especially the remarks of Sir Lauder Brunton, *Collected Papers on Circulation and Respiration*, First series, London, p. 18.

individuals. Lately I have been seeing a man, aged 28 years, with congenital pulmonary stenosis. The cyanosis is very great and is increased by walking. Sometimes he looks almost black in the face. His fingers and toes are clubbed, and examination of his blood shows a remarkable condition of (*compensatory*) polycythemia and "polyhæmia" ("plethora vera"). The blood is so "thick" that it is relatively difficult to suck it up into a capillary tube. The number of red cells in the cubic millimetre and the percentage of hæmoglobin are about double the normal figures, whilst the total quantity of blood in the body (as kindly estimated for me by Dr. J. S. Haldane and Dr. C. Gordon Douglas by means of Haldane and Lorrain Smith's carbon-monoxide method) is greatly above the normal for the body-weight. This man enjoys life, works well at his business, and takes a good deal of open-air exercise. He attributes his relatively good condition to the exercise to which he has accustomed himself, and says he can do as good a day's work as anyone in his trade, and walk for hours without ill effect. He tells me he finds that "an easy and lazy life" does not agree with him.

Persons with compensated cardiac valvular lesions seem to derive benefit from open-air exercise in the same way as ordinary healthy persons do, even if they cannot stand as much and have to be more careful to avoid "strain." Two groups of patients who are sometimes said to have "weak hearts without organic disease" probably benefit even more than ordinary normal individuals do from regular open-air muscular exercise (short of strain). I refer (1) to the group of young, tall, lanky ("over-grown") adults with "bad circulation" (with circulation more or less of the "chillblainy type") and often with orthostatic albuminuria; (2) to a group of patients with cardiac neuroses, especially sensory neuroses. With regard to the latter group, I would compare the beneficial effect of open-air exercise to the well-known effect of fevers on certain (but not all) functional nervous troubles (*fibris dissipat spasmos*), and I think that this effect of fevers is really due to the extra work which they force the body to do, for the necessity of resisting an infection is a greater stimulus to a form of tissue-exercise (the work thrown on the metabolic tissues, &c.) than any other good or any ordinary voluntary effort.

From this point of view I would remark that some functional nervous troubles may almost be regarded as the expression of a misdirected expenditure of nervous energy, and for such cases

open-air exercise (with a non-stimulating form of diet) has undoubtedly a special value. For such cases Pope's lines are really appropriate:—

“Better to hunt in fields for health unbought
Than fee the doctor for a nauseous draught.”

Perhaps it was more to his recommendation of open-air exercise than to the use of the mineral waters that Jephson owed his success at Leamington Spa:—

“For all his disciples who Jephson obey,
Walk out in all seasons all hours of the day.”

In chronic non-febrile cases of pulmonary tuberculosis the great use of graduated open-air muscular exercise under medical supervision is now generally acknowledged, but I do not think this beneficial action is merely due to auto-inoculation. Graduated exercise seems to do good in nearly all kinds of chronic disorders. Suitable and regular exercise (mental as well as muscular) prevents “rusting” and reveals defects in the vital mechanism, so that it exerts perhaps an even more preventive than curative action in regard to disease. No age contra-indicates exercise in some form and in some degree or other.

When one notes the great utility of muscular exercise (of some kind or other) in nearly every condition of chronic disease or ill-health, one is inclined to ask—What are the contra-indications to voluntary muscular exercise? The real contra-indications are obvious enough: conditions of extreme exhaustion of the myocardium, of acute toxæmic causation or resulting from the advanced progress of chronic disease, and conditions in which the patient is of necessity being, or has just been, sufficiently exercised. Thus no one would recommend muscular exercise when the patient's metabolic organs are already being driven (like an express train at full speed) by some raging fever. Severe pain (articular, etc.) on movement is of course a practical contra-indication. An uncompromising attitude of laziness or disbelief on the part of the patient unfortunately sometimes constitutes a kind of contra-indication, because the mere suggestion of the advisability of more exercise leads to an immediate change of medical advisers.

Unsuitable exercise may, of course, produce exacerbations of many quiescent diseases, such as pulmonary tuberculosis and cholelithiasis. However, even in regard to cholelithiasis, a life

necessitating constant open-air muscular exercise, especially climbing exercise (with increased respiratory movements), such as the life of peasants in mountainous districts, seems to act to some extent as a preventive; though when gall-stones are already present unsuitable muscular exercise (especially exercise necessitating sudden and violent movements) may induce attacks of gall-stone colic and various inflammatory complications.

THE FAUCIAL TONSILS, WITH SPECIAL REFERENCE TO THEIR REMOVAL BY ENUCLEATION.*

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THE object of this paper is to bring before the Society some considerations in regard to the anatomy, physiology, and pathology of the tonsils, and to give an account of a comparatively recent improvement in our operative procedure for the removal of these structures—an improvement for which we are indebted to the United States of America.

ANATOMY.

These structures are two superficially placed almond-shaped lymphatic glands, which lie between the faucial pillars. They consist essentially of three elements—(1) a fibrous tissue capsule; (2) lymphoid tissue; (3) mucous membrane (Fig. 5). They may be described as having two surfaces (internal and external), two borders (anterior and posterior), and two poles (upper and lower).

In the submerged variety of tonsils (Figs. 4 and 9), with which this paper mainly deals, the *internal surface* has two parts—I. Below the level of the opening of the supra-tonsillar fossa this surface is covered by squamous epithelium, continuous with that lining the mouth and pharynx. The superficial epithelium passes down and lines the crypts of the tonsil which reach into the substance almost to the capsule. At the orifices of the crypts the epithelium is composed of several layers of cells, but deeper down within the crypts it consists often of only one layer, and, at the bottom of these involutions, numerous gaps occur in the lining membrane. II. *The upper part* of the inner surface of the tonsil—the velar lobe—is above the level of the opening of the supra-tonsillar fossa, and is imbedded in the lateral part of the soft palate; it is surrounded by the capsule of the tonsil (Fig. 4).

The external surface is completely covered by the capsule, and lies in close relationship to the superior constrictor muscle. In order to

* Read before the Medico-Chirurgical Society of Edinburgh, 3rd May 1911.

understand the capsule of the tonsil we must refer for a moment to the muscles and fascia of the pharynx. The superior constrictor arises in front from the internal pterygoid process, the pterygo-maxillary ligament and lower jaw, and passes backwards and somewhat upwards to its insertion into the pharyngeal tubercle and the raphé; internal to this we have the muscles of the Eustachian tube and soft palate above, and below the palato-glossus and the palato-pharyngeus along with the pharyngeal aponeurosis. This latter structure, where it covers the outer surface of the tonsil, forms the so-called "capsule" which sends septa into the substance of the gland interdigitating with the epithelial involutions which form the crypts (Figs. 1 and 2); these septa sometimes contain muscle tissue. Between these two—the septa from the capsule and the epithelial invaginations—we have the lymphoid tissue of which the main bulk of the tonsil is composed. In actively functioning tonsils this lymphoid tissue shows germinal centres, but in atrophic tonsils these are not observed.

The *anterior border* of the tonsil lies in contact with the anterior pillar of the fauces, which is composed of the palato-glossus muscle with its covering of mucous membrane, and the *posterior border* is in contact with the posterior pillar containing the palato-pharyngeus. On the outer surface of the capsule, at its lower part, some of the fibres of these muscles interlace, and are joined by fibres from the superior constrictor; at this point, therefore, the fibres of these three muscles are attached to the lower part of the outer surface of the tonsil capsule (Fig. 2).

Below the *lower pole* of the tonsil lies the base of the tongue, and the lymphoid tissue of the tonsil is prolonged over this region, forming the so-called lingual tonsil. The *upper pole* of the tonsil contains the so-called "supra-tonsillar fossa"; this fossa is not "supra-tonsillar" at all, but is really intra-tonsillar, because the capsule of the tonsil includes the fossa. Thus if we make a vertical transverse section through the tonsil, including the fossa, we see that above the tonsil lie the mucous glands in the lateral part of the soft palate (Fig. 2). From above, downwards, we next come to the capsule of the tonsil through which the ducts of some of these glands open into the supra-tonsillar fossa. Between the upper part of the capsule and the cavity of the fossa there is a layer of lymphoid tissue, and, finally, before reaching the fossa itself, we have the layer of epithelium which lines this cavity.

We have already seen that the tonsil is intimately related to

two of the muscles of the soft palate, palato-glossus and palato-pharyngeus, the former of which is inserted into the side of the tongue. We must also remember that the soft palate and its movements are intimately connected with the muscles which open the Eustachian tube (the levator palati or levator tube, and the tensor palati or dilator tube). It is not surprising, therefore, that Reik claims that enlargement of the tonsil may be associated with Eustachian obstruction, not because enlarged tonsils mechanically press on the orifice of the Eustachian tube, but because they interfere with the action of the soft palate, and hence of the muscles which act upon the tube. During the act of swallowing the soft palate is raised, and the superior constrictor and the muscles of the soft palate compress the mucous glands in the lateral part of the velum and force the secretion down the ducts into the supra-tonsillar fossa, and thence into the faucial opening. According to Hett, the upper pole of the tonsil is pressed downwards and inwards during the act of deglutition.

Folds of Mucous Membrane in Connection with the Tonsil.—As before stated, the tonsil lies between the pillars of the fauces, and the mucous membrane which covers these structures is continued into folds as it passes on to the tonsil. Thus above we have the plica supra-tonsillaris, in front the plica triangularis, and below the plica infra-tonsillaris; these folds are seldom all present in a single case, and even when present they pass one into the other. The best way to understand the relation of the tonsil to the faucial pillars and the mucous membrane folds just described is to compare it to the glans penis surrounded by the prepuce—the pillars, along with the mucous membrane folds, represent the prepuce, and the tonsil, below the level of the supra-tonsillar fossa, corresponds to the glans. In some cases where the upper pole of the tonsil is not strongly developed, and where the orifice formed by the pillars and the folds of mucous membrane is wide, we notice that when the patient retches the supra-tonsillar fossa is opened up, or everted, and the tonsil is forced out from between the pillars until it lies on the dorsum of the tongue internal to the isthmus of the fauces (Fig. 8). We are often able to see that the secretion contained in the crypts is extruded by this muscular action. These so-called “pedunculated” tonsils correspond to a glans penis surrounded by a wide prepuce. In other cases, where the upper pole of the tonsil—velar lobe—is strongly developed, and where the orifice above mentioned is narrow, we notice that when the patient retches the tonsil is not

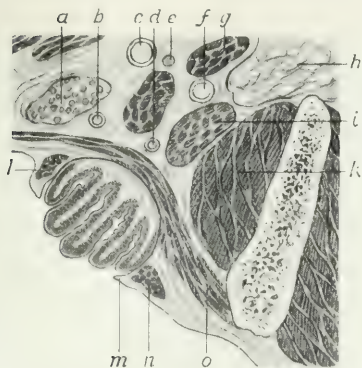


FIG. 1. Horizontal section through region of the left tonsil (after Cunningham).
a. Retropharyngeal lymph gland.
b. Ascending pharyngeal artery.
c. Internal carotid. *d.* Ascending palatine artery. *e.* Glossopharyngeal nerve. *f.* External carotid artery. *g.* Stylohyoid. *h.* Parotid gland. *i.* Styloglossus. *k.* Internal pterygoid. *l.* Palato-pharyngeus. *m.* Plica triangularis. *n.* Palato-glossus. *o.* Superior constrictor.

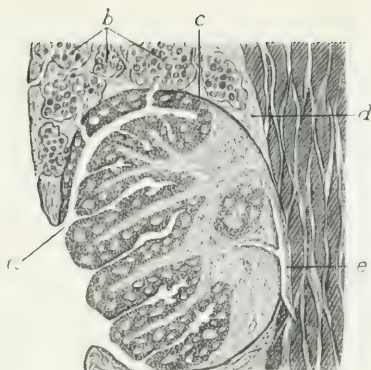


FIG. 2. — Vertical transverse section through region of left tonsil.
a. Orifice of supra-tonsillar fossa. *b.* Mucous glands in lateral part of soft palate. *c.* Upper part of tonsil capsule. *d.* Peritonsillar space. *e.* Hilum of tonsil.

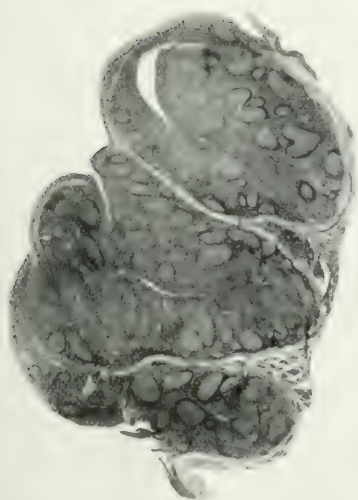


FIG. 3. — Pedunculated left tonsil completely removed with the guillotine. Vertical transverse section $\times 2$ diam. The capsule, which is seen to the right, is entire.



FIG. 4. — Submerged right tonsil enucleated with volsellum and scissors. Vertical transverse section $\times 2$ diam.
a. Capsule. *b.* Supra-tonsillar fossa. *c.* Upper part of tonsil capsule. *d.* Entrance to supra-tonsillar fossa.

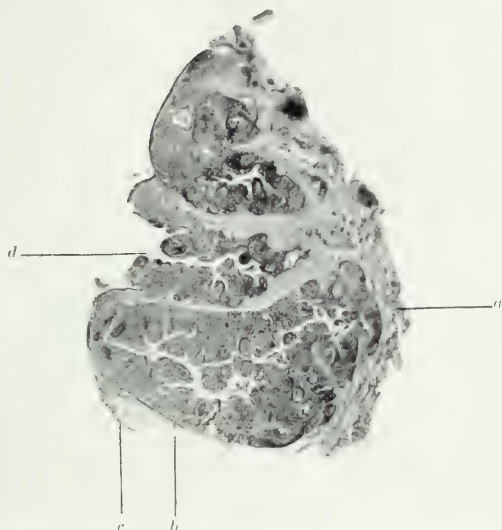


FIG. 5. Horizontal section of left tonsil removed by emuclation. *a*. Outer part of capsule. *b*. Anterior part of capsule. *c*. Plica triangularis cut through. *d*. Orifice of one of the crypts.



FIG. 6.—Right tonsil from case of keratosis pharyngis. The guillotine operation was performed. *a*. Crypt containing epithelial overgrowth cut through. *b*. Lymphoid tissue of tonsil cut through. *c*. Hyperkeratosis of epithelium lining crypts.

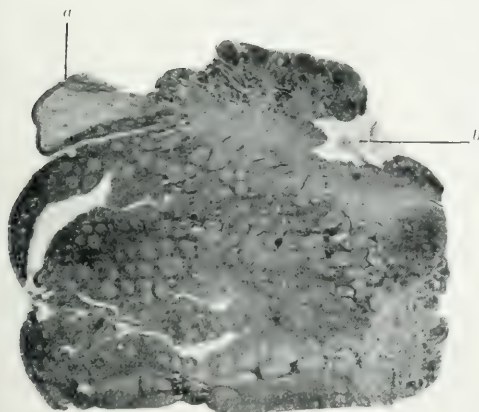


FIG. 7.—Upper part of left tonsil from case of peritonsillar abscess. *a*. Plica supra-tonsillaris. *b*. Peritonsillar abscess cavity.

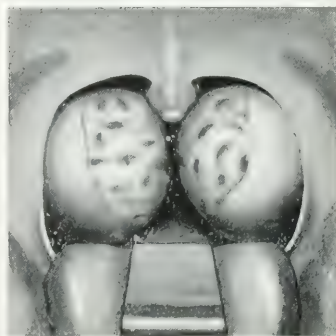


FIG. 8.—Pedunculated tonsils as seen when the patient retches. Type suitable for complete removal with guillotine.



FIG. 9. Submerged left tonsil. *a.* Plica supra-tonsillaris. *b.* Plica triangularis. *c.* Plica infra-tonsillaris. Note the bulging of the lateral part of the soft palate due to the submerged part of the tonsil.

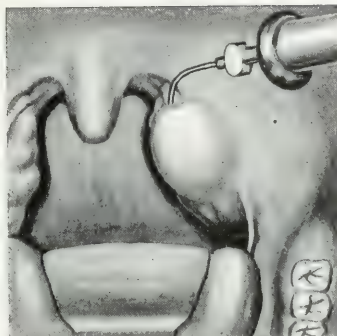


FIG. 10. Method of injecting the plicae in cases where local anaesthesia is used.



FIG. 11.—The tonsil is gripped by the volsellum and pulled inwards.

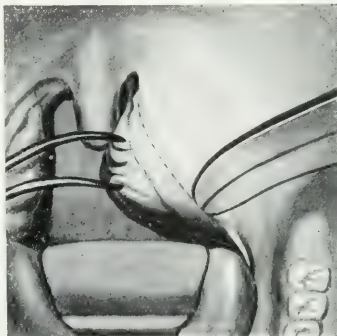


FIG. 12.—Shows the line of scissor cut through the mucous membrane of the plica internal to the anterior pillar. *N.B.* The cut must not penetrate into the tonsil itself.



FIG. 13. The anterior and upper parts of the tonsil have been dissected out. The tonsil is still attached below and behind.

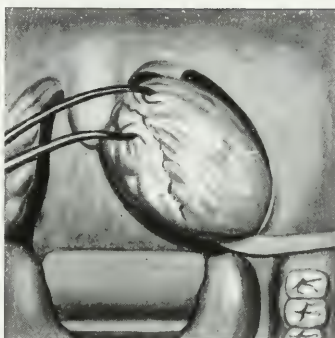


FIG. 14. The lower pole of the tonsil may be freed in some cases with the curved probe-pointed bistoury. The tonsil itself is pulled upwards, while the knife is passed below it.

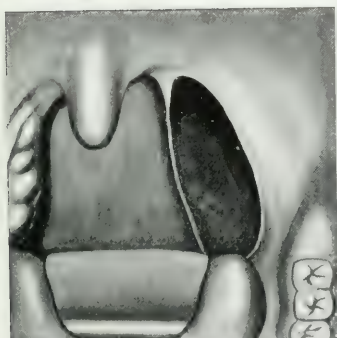


FIG. 15. The cavity left by enucleation of the tonsil.

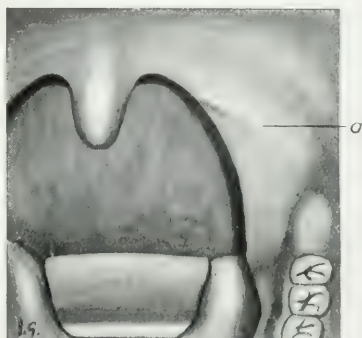


FIG. 16. The result one year after enucleation. *a*. Anterior pillar flattened out and incorporated with the posterior pillar.

protruded between the pillars, but merely forms a bulging on the lateral aspect of the soft palate (Fig. 9). These tonsils have been called "submerged," and correspond to cases of phymosis.

THE PERITONSILLAR SPACE.

This space is situated between the upper part of the tonsil capsule and the inner surface of the superior constrictor, and is occupied by loose areolar tissue. The anterior pillar lies in front of the peritonsillar space, the posterior pillar behind, and above are the mucous glands of the soft palate; below, the space is closed, as before mentioned, by the attachment of the superior constrictor and the two pillar muscles to the outer part of the tonsil capsule. It is in this potential space (Fig. 2) that suppuration occurs in cases of peritonsillar abscess.

Blood-Supply.—Hett states that the tonsil is supplied mainly by the tonsillar and ascending palatine branches of the facial artery which pierce the capsule at the hilum low down on its outer surface. The tonsil also receives branches from the ascending pharyngeal, the internal maxillary (descending palatine branch), and from the dorsalis lingue branch of the lingual. The final branches from these vessels pass into the tonsil along the septa sent in by the capsule.

There are two views as to the *lymphatics of the tonsil*. According to one view the afferent lymphatics of the tonsil come from the nasal mucous membrane, so that enlarged tonsils may be regarded as a sign of disease in the nose—v. Lénárt has shown that granular material injected into the nasal mucous membrane passes along lymph channels to the tonsils. According to the other view, the tonsil has no afferent lymphatics unless the gaps in the epithelium lining the crypts can be regarded in this light. The efferent lymphatics pierce the capsule and pass downwards to traverse the superior constrictor, and then open into the superior gland of the median deep cervical chain, that is to say the jugulo-digastric or "tonsillar" gland, which, when enlarged, may readily be felt just behind and below the angle of the lower jaw. The two tonsils are connected by lymphatic channels—across the middle line through the soft palate—a fact which explains the frequency and rapidity with which inflammation of one tonsil often follows that of the other.

The tonsillar branches of the glosso-pharyngeus enter below, while the middle and posterior palatine nerves from Meckel's ganglion send branches from above.

COMPARATIVE ANATOMY AND DEVELOPMENT OF THE TONSIL.

Ketterer has shown that the tonsils are not vestigial structures. They are absent in reptiles until the crocodile stage is reached, and attain great complexity only in the higher mammals—presumably a recently-acquired organ has some function. Barnes has shown that in the human embryo the tonsils have little lymphoid tissue, and that the epithelium of the crypts is at first similar to that on the surface; later the central cells of the epithelial involutions break down and are expelled. From the fourth to the sixth months of life lymph follicles begin to show distinctly, and lymphocytes invade the epithelium of the crypts, and, in places, disintegrate its layers. It is these lymphocytes which pass into the cavity of the crypts, and, being frequently retained, form caseous masses. Wood has suggested that the epithelial cells lining the crypts undergo metamorphosis, the result of which is the formation of cells morphologically similar to the lymphoid cells. He also states that transitional cells are found between the epitheloid and lymphoid cells.

FUNCTIONS OF THE TONSILS.

Rosenheim states that it is generally admitted that lymphocytes are formed in the germinal centres, and that they pass out towards the periphery and force themselves, or are forced, between the epithelial cells lining the crypts. Some writers consider that this process renders the tonsil specially vulnerable, while others hold that it is protective in character. These two views have been termed the "infective" and "protective" theories. Reference has already been made to the opinion of Schoenemann that the tonsils drain the nasal mucous membrane. Spicer regards the tonsils as organs for elimination, while Massini has suggested that they furnish an internal secretion. Fox believes that they are concerned in salivary digestion. A more generally accepted view is that they are one of the sources of lymphocytes. Gulland is of opinion that they have a bactericidal function. Hendelsohn, Wood, Wright, and others have shown that foreign bodies such as carmine granules pass through the epithelium lining the crypts into the substance of the tonsil, but that bacteria are kept back in the crypts. In a recent paper Good states that early immunisation is the function of the tonsils. According to this theory bacteria multiply in the crypts and produce toxins which are absorbed in small quantities; in this way a certain degree of immunity

results. According to Good's theory the mucus in the crypts serves as a culture medium. Dwyer investigated the bacteriology of the tonsil crypts in seventy-two cases, and found one or more varieties of streptococcus in fifty cases, the pneumococcus in fourteen, the micrococcus catarrhalis in twelve; in sixteen cases diphtheria or diphtheroid organisms were found, in twenty the staphylococcus, in four the diplococcus mucosus capsulatus, and in five the influenza bacillus. Davies examined forty-five tonsils, and in every case found a streptococcus. Good points out that the tonsils probably functionate early in life, and that, relatively speaking, the tonsils are largest up to the fourth year, after which they show a tendency to atrophy. Levinstein has examined hyperplastic tonsils and found active mitosis in the germinal centres, along with an increase in size of these centres, and therefore an increase in the size of the lymph follicles. In hypoplastic tonsils, on the other hand, he found an absence of mitosis, a decrease in the number and size of the follicles, and a tendency of the germinal centres to disappear. Lance does not consider simple hypertrophy of the tonsils to be pathological, but regards it merely as an expression of the power of resistance; he notes that in young children during dentition the tonsils become larger. Good calls attention to the fact that infants, when attacked by pneumonia, diphtheria, scarlatina, &c., die more frequently than adults, as they have not yet become partially immunised. The conclusion Good comes to is that in children under three years of age the tonsils should not be enucleated.

DISEASES OF THE TONSILS.

1. *Simple Chronic Hypertrophy*.—It is no uncommon thing for the tonsils to be so greatly enlarged that they meet in the middle line, and it is easy to understand how in these cases they interfere with respiration, deglutition, and speech (Fig. 8). The oropharyngeal cavity is a narrow one, and when the mouth is shut there is little room between the back of the tongue and the posterior wall of the pharynx.

2. *Recurring Attacks of Tonsillitis, either Follicular or Parenchymatous*.—Rosenheim gives a list of diseases that have been attributed in certain cases to infection through the tonsils. This includes appendicitis, acute rheumatism, arthritis deformans, pleurisy, pericarditis, pneumonia, phthisis pulmonalis, parotitis, nephritis, osteomyelitis, pyæmia, and septicæmia. Loeb records four cases of acute hæmorrhagic nephritis following tonsillitis.

F. Meyer isolated from four cases of rheumatic tonsillitis a diplococcus which produced arthritis in rabbits, while Wagener found the same organism present in the tonsils and in the exudation into the joints. It is noteworthy that the internal remedies recommended in cases of tonsillitis—salicylate or benzoate of soda, salol and aspirin—should be those most generally given in cases of acute rheumatism.

3. *Peritonsillitis and Peritonsillar Abscess (Quinsy).*—

Patients who are subject to quinsy frequently suffer from attacks every spring and autumn, and sometimes even as often as five or six times a year. Peritonsillitis is, of course, always a result of acute inflammation of the tonsil itself, and Hett is of opinion that peritonsillar abscess is associated with obstruction of the supra-tonsillar fossa and faulty drainage of the crypts which open into it. Infection spreads to the lymphatics of the capsule, and an abscess forms in the peritonsillar space (Fig. 7). On account of the attachment of the superior constrictor and of the two pillar muscles to the lower part of the capsule, the abscess does not burrow downwards, but points, as a rule, through the anterior pillar, though it may open into the supra-tonsillar fossa, or posteriorly close to the posterior pillar. The best method of draining the abscess is through the anterior surface of the soft palate, above and external to the anterior pillar. Frequent attacks of quinsy lead to adhesions between the capsule of the tonsil, anterior pillar, and superior constrictor. These adhesions make enucleation difficult, but the guillotine operation is absolutely useless in such cases.

4. *Tubercular Disease of the Tonsil.*—In regard to the source of infection in cases of tubercular glands in the neck, there is still a considerable amount of dispute, but the tendency is to look upon the tonsil as the original seat of disease. Hurd and Wright found the tonsils definitely tubercular in nine out of twelve cases of tubercular cervical adenitis, and Matthews in five out of eight, whereas in fifty cases in which the cervical glands were not affected no tubercle was found in the tonsils. Carmichael says that primary tuberculosis of the tonsils is by no means so rare as is usually supposed, and that, out of five hundred tonsils examined by various observers, sixteen (3 per cent.) were tubercular. He maintains that, in cases of tubercular cervical adenitis, the first gland to be involved is the tonsillar gland before mentioned. He himself examined the tonsils from fifty cases; in thirty-seven of these the cervical glands were only slightly enlarged, and in two of the fifty

the tonsils were tubercular. Of thirteen other cases with extensive glandular infection the tonsil was found to be tubercular in five, and the proportion would probably have been greater had serial sections been cut. Carmichael thus found tuberculosis of the tonsils in seven out of sixty-three cases, and states that in five of the seven the tubercle was probably primary. He suggests that the source of the infection is probably tubercular milk lodging in the crypts of the tonsil. In a recent paper Leuwer has shown that during the act of swallowing the food passes over the lateral aspects of the pharynx, and not along the middle line; clinical experience in the extraction of fish bones from the faucial region and pyriform sinuses certainly seems to confirm this view. Hett says that in tubercle and sarcoma of the tonsil the capsule is resistant, and the disease therefore tends to spread towards the pharynx, because this is the path of least resistance. According to Carmichael the tubercular tonsil is small and submerged.

5. Such conditions as Vincent's angina, diphtheria, keratosis, tonsil calculus, epithelioma, and sarcoma hardly come within the limits of this paper. Hett states that in the early stages of sarcoma enucleation offers a fair chance of cure.

INDICATIONS FOR TONSIL OPERATION.

In cases of simple chronic hypertrophy, where the tonsils are pedunculated, the guillotine operation is quite sufficient. In cases of recurrent tonsillitis and peritonsillitis, in which the tonsils are submerged, and in cases of tubercular cervical adenitis, enucleation is called for.

Contra-Indications.—It is advisable if possible to avoid operating on the tonsils of singers, especially those whose voices are already trained. Price-Brown states that singing teachers have reported to him that several pupils had had their singing voice practically destroyed by removal of the tonsils. Operation is also contra-indicated in hæmophilia, leukemia, status lymphaticus, and acute inflammatory conditions of the tonsils. Dufour states that it is not advisable to operate on the tonsils during the menstrual period.

TREATMENT OF DISEASES OF THE TONSILS.

1. *Simple Measures—Gargles and Paints.*—These are of little value, even if the patient is an adept in their use. From what has already been stated in regard to the anatomy of the tonsils, it will be readily understood that gargles and paints can only reach the surface and cannot penetrate deeply into the crypts.

2. *Washing Out the Crypts by Means of a Blunt-pointed Angled Syringe.*—This may be resorted to in the case of singers and of those who, for one reason or another, object to more radical measures. Solutions of argyrol or collargol may be recommended.

3. *Breaking Down the Tonsillar Crypts so as to Allow a more Free Escape of the Retained Secretion.*—Gurich has treated 140 cases of rheumatism by opening the crypts and removing the cheesy secretion. This was followed by an exacerbation of the joint troubles, which this author claims as a proof of the connection between the two conditions. Only twenty-three cases failed to react to the treatment: of the remaining 117 cases ninety-eight were completely cured, and many of these were of long standing.

4. *Cauterising the Crypts.*—This always seems to me a somewhat out-of-date procedure. The crypts go right down almost to the capsule, and it is impossible to be certain that one has entirely closed each crypt from the bottom right up to the mouth. Further, these crypts, which are most difficult to drain, that is to say those opening into the supra-tonsillar fossa, are inaccessible.

5. *The Guillotine Operation.*—This is the operation suited for those cases of chronic simple hypertrophy in which the enlargement merely acts mechanically (Figs. 3 and 8). For the operation to be successful the tonsil should be of the pedunculated variety (Fig. 8). During the year 1910 over 900 cases were operated on in Dr. Logan Turner's department by means of the guillotine, whereas only sixty-five enucleations were performed. A modification of the guillotine operation is that in which a volsellum is passed through the ring of the guillotine and the tonsil is firmly grasped and, as far as possible, drawn through the ring of the instrument before the knife is pushed home. St. Clair Thomson recommends this method. Whillis and Pybus maintain that they can enucleate 45 per cent. of tonsils with the guillotine. When the ring has been passed over the projecting part of the tonsil they press with the tip of the left forefinger on the outer part of the anterior pillar so as to force the tonsil through the ring of the instrument. Hett, on the other hand, maintains that only 2 per cent. of tonsils are enucleated with the guillotine. He makes this statement after obtaining a large number of tonsils removed with the guillotine in many of the large London hospitals. I have frequently been informed by a child's parents that "the tonsils have been removed but have grown in again" after the guillotine operation. In cases of recurring tonsillitis and peritonsillar

abscess the patient is seldom completely relieved by any operation short of enucleation. Fig. 6 shows the slice that is removed from a submerged tonsil by the guillotine operation. If Fig. 6 be compared with Fig. 4—taken from a case in which the tonsil was enucleated—the greater efficiency of the latter method will be clearly demonstrated.

6. *Morcellment*.—Various cutting forceps have been devised for the removal of the tonsils in small pieces.

7. *Volsellum and Knife*.—This old operation is much more efficient than the guillotine: the knife should be very sharp. The operation is not, however, based on anatomical study of the tonsils like the following procedure.

8. *Enucleation*.—There are several varieties of this operation. As originally introduced by Pynchon, the operation was performed by cauterizing dissection, the tonsil being grasped by the volsellum. Others use various forms of knife to dissect out the tonsil. Many American operators prefer the tonsil snare, which is applied after a certain amount of dissection has freed the tonsil from the pillars and exposed the velar lobe. The method I have always used has been that of scissor dissection aided by the finger and, in some cases, by the use of a curved probe-pointed knife liberating the lower pole of the gland and dividing the vessels at the hilum.

Preparation of the Patient.—Williams recommends a hypodermic injection of atropine before enucleation, and Lothrop is in favour of an injection of morphia and atropine. Some operators prepare the field of operation by washing out the tonsil crypts for several days beforehand. This seems to me entirely useless, because if the operation is properly performed the crypts are never reached, as all the cutting should be done outside the tonsil capsule. The only preparation I have advised is the removal of decayed teeth some considerable time before the operation on the tonsils. In this connection it is worthy of remark that Osborne comes to the conclusion from the examination of nearly 2500 children that enlarged tonsils and adenoids have more to do with cervical adenitis than dental caries.

Anæsthesia.—This operation may be performed either under local or general anæsthesia. The majority of the patients who require enucleation are adults, who, with few exceptions, are able to submit to the operation under local anæsthesia. This method has several advantages: (1) the patient is sitting upright so that there is less hæmorrhage; (2) the patient can also, if necessary, rinse out his mouth from time to time during the operation; and (3) there is

no interference with the patient's respiration on account of the tongue falling back and blocking the pharynx. In children, on the other hand, and in nervous adults it is advisable to give a general anæsthetic. In America ether is used almost entirely, but I have not so far employed any other anæsthetic than chloroform, which should be pushed to the extent of abolishing the faucial reflexes. I usually operate by direct daylight, whether the operation is performed under local or general anæsthesia, but reflected light is sometimes a great advantage.

ENUCLEATION UNDER LOCAL ANÆSTHESIA.

The patient is placed on a low seat facing the window, and the light falls into his mouth over the shoulder of the operator, who sits on a somewhat higher stool. The faucial tonsils, oro-pharynx, and back of the tongue are first of all sprayed with 10 per cent. cocaine: five to ten minutes later the injection is made. So far I have always used .5 per cent. cocaine to which a few drops of adrenalin have been added (.5 min. to 1 dr.). The injection should be made with a curved needle into the plica triangularis just internal to the anterior pillar (Fig. 10); the needle must only be pushed through the mucous membrane. If the injection is successful the mucous membrane is seen to rise up in the form of a white bleb about the size of a threepenny piece. The needle is now withdrawn and reinserted somewhat higher up towards the junction of the anterior and posterior pillars, and a further injection is made at this point underneath the mucous membrane. In many cases it is also advisable to inject the anterior surface of the posterior pillar. In this way the line of incision is anæsthetised. A similar injection is made on the other side if this tonsil has also to be removed. Yankauer recommends the injection of the posterior palatine nerves on the lines of alcohol injection in cases of neuralgia. I have tried this method, and the patients when questioned afterwards stated that the pain was much greater on the side on which the attempt had been made to inject the nerves; further practice might, however, render this the more efficient method. As soon as the injection has been completed the operation may be commenced. It is advisable to have a nurse to steady the patient's head and a good assistant to depress the tongue or to exert traction upon the tonsil as may be required. The instruments needed are not numerous—a broad tongue depressor, a uterine volsellum, a pair of blunt-pointed scissors curved on the flat, a long probe-pointed curved bistoury, and

some throat sponges in long holders. The left tonsil is firmly grasped by the volsellum, the upper claw of which is inserted into the supra-tonsillar fossa and the other into the lower pole of the tonsil. It is important to take a good grip of the tonsil with the volsellum, for unless this is done the instrument will tear out. One is often surprised, when inward traction is now made on the tonsil, at the large size of the gland as it bulges the lateral part of the soft palate (Fig. 11), and one realises that the part covered by epithelium, and usually spoken of as "the tonsil," really comprises little more than one-third of the whole structure; in fact the first impression one obtains is that one is about to remove the lateral part of the soft palate. The difference between the guillotine operation and enucleation lies in the fact that, in the first case, one can only remove that part of the tonsil which can be forced internal to a line joining the pillars, whereas in the process of enucleation one dissects out the upper pole of the tonsil from its bed and removes the entire structure. One now commences to clip with the blunt-pointed scissors through the plica triangularis just internal to the anterior pillar, beginning below and passing upwards (Fig. 12). *The clips must only pass through the mucous membrane and must not incise the tonsil capsule.* If once the capsule be penetrated it is extremely difficult to get back again to the proper plane of cleavage, and hemorrhage interferes with the operation. The line of scissor-cut through the mucous membrane is now continued backwards in the arch between the two pillars. All this time strong traction is kept up by means of the volsellum, and after a little scissor dissection the anterior and upper pole of the tonsil begins to appear (Fig. 13). In addition to depressing the tongue, the assistant should retract the anterior pillar with a blunt hook. In many cases one is now able to take a fresh grip of the upper pole of the tonsil and to pull it downwards and forwards so as to get at the mucous membrane which passes from the tonsil on to the posterior pillar. The scissors are now laid aside for a moment, and the forefinger of the right hand is inserted through the incision into the interval between the tonsil and the anterior pillar and swept round the tonsil from before backwards and from above downwards. If the operator is working in the right plane it is easy to separate the tonsil in its capsule from the superior constrictor muscle unless there have been numerous attacks of peritonsillitis which have caused firm adhesions to arise in this situation, *i.e.* the peritonsillar space. In such cases the dissection must be continued by scissor-cuts alone.

This finger dissection is the only part of the operation that the patient objects to, and in many cases it can be dispensed with and its place taken by the scissors. (Lothrop states that the pain after tonsillectomy is most severe in cases in which the finger has been used.) The tonsil is now attached only at its lower part, or, if it has been found impossible to separate the tonsil from the posterior pillar, at its posterior and lower part. These remaining attachments include the hilum at which the vessels enter, and also the lingual prolongation of the tonsil. At this point it may be convenient for the patient to spit out the blood which has accumulated in his mouth and pharynx and to wash out his mouth with boric lotion. Even if the bleeding be severe it is easy to complete the operation with the long curved probe-pointed bistoury. The tongue depressor is again introduced and the tonsil is pulled upwards by means of the volsellum. The knife is inserted below and to the inner side of the tonsil, and, while strong inward traction is kept up with the volsellum, the knife cuts outwards and upwards and divides the lingual prolongation, the vessels at the hilum, and, if it still remain, the mucous membrane attaching the tonsil to the posterior pillar (Fig. 14). If, however, the bleeding be not excessive, the scissors may be used to complete the operation. The tonsil is pulled forwards over the anterior pillar and the mucous membrane attaching it to the posterior pillar is completely divided; finally the tonsil is pulled upwards while the scissors divide the lingual prolongation and the vessels at the hilum.* The patient now washes out the mouth two or three times, and then the right tonsil is dealt with in the same manner. If the operator be ambidextrous the assistant can again depress the tongue while the operator grasps the right tonsil with the volsellum held in his right hand and uses the scissors with the left. If, on the other hand, the operator prefers to use his right hand for the dissection, the assistant takes charge of the volsellum while the operator depresses the tongue with the spatula held in his left hand. As a rule with local anaesthesia there is little or no bleeding at the time of the operation, but the haemorrhage occurs from half an hour to two hours later, when the effect of the adrenalin has passed off. If the enucleated tonsil be examined at the

* Of late I have completed the operation with the help of the tonsil snare; this instrument is applied after the tonsil has been freed from the pillars and the upper pole has been well exposed. By this method haemorrhage is greatly reduced as compared with that observed when the knife or scissors are used to complete the enucleation.

end of the operation it is not uncommon to find a little muscle tissue attached to the lower part of the outer surface of the capsule at the point where the superior constrictor and the two pillar muscles were attached.

THE OPERATION UNDER GENERAL ANÆSTHESIA.

After the patient has been anæsthetised the end of the operating table is somewhat lowered so that the head of the patient hangs over, though not to the extent of a right angle with the trunk. The operator stands on the patient's right side facing the head of the table, and the light falls directly into the patient's mouth from the window. It is advisable to have two assistants, one to swab out the blood which accumulates in the pharynx, while the anæsthetist uses the tongue depressor and steadies the patient's head. The gag is inserted and opened, and the left tonsil is dealt with as described above. As a rule, after the removal of the first tonsil the patient is beginning to come out of the anæsthetic: accordingly a small sponge rung out of hydrogen peroxide and held in a long sponge-holder is firmly inserted into the cavity left by the removal of the first tonsil, the mouth gag is closed but not removed, the patient is turned over almost on to his face and more chloroform is given. When the patient is again "under" the head is lowered, the gag opened, the sponge removed, the pharynx swabbed clean, and the right tonsil dealt with as above described.

After-Treatment.—The patient should be kept in bed for at least one day, and should avoid speaking as much as possible; he should rinse out his mouth frequently with boric lotion, phenol sodique, or some other mouth wash. Children who cannot or will not use mouth washes may be allowed to suck lozenges containing formalin. The large cavity left between the pillars (Fig. 15) usually fills with blood clot within a few hours of the operation, and this clot may still be seen on the second day, towards the end of which it usually comes away, and the raw surface is thereafter covered by a greyish-white membrane, which must not be mistaken for diphtheria. There is, as a rule, considerable pain on swallowing for four or five days after tonsillectomy, and, as is usually the case in dysphagia, the patient finds that thickened soups and milk puddings are most easily dealt with. Pyncheon advises that the patient should sleep with his head well elevated for two or three nights after the operation, that he should use a gargle every quarter of an hour,

and that the wound cavity should be sprayed out every hour with hydrogen peroxide. Although in my experience of one hundred cases I have had two of moderately severe hæmorrhage, I have, so far, had no case of sepsis following tonsillectomy, and accordingly I do not think these troublesome measures are necessary. An inhalation of benzoin from a jug of hot water may, however, relieve the sore throat. The final healing after enucleation occurs in some cases by the growing together of the two pillars from above downwards, thus narrowing the arch of the fauces. In other cases the anterior pillar becomes flattened out and passes into the posterior pillar (Fig. 16). Patients upon whom the operation has been performed say that they find no inconvenience in talking or swallowing, but, so far, I have not performed the operation upon a singer, so that I cannot state the effect on the voice. In order to obviate the growing together of the pillars, Pyncheon recommends that the space between them should be massaged with cotton-wool swabs soaked in perchloride of iron and glycerine.

DIFFICULTIES AND DANGERS.

1. *Friable and Adherent Tonsils*.—As before stated, the two important things are to grasp the tonsil firmly and to keep outside the tonsil capsule. If the tonsil be very friable the volsellum is apt to tear out however firm a grip be taken, while in patients who have suffered from peritonsillitis the tonsil is firmly fixed and cannot be drawn inwards to any extent with the volsellum. In these cases one is specially apt to clip through the tonsil capsule, and so render complete enucleation almost impossible.

2. *Trismus*.—A short time ago I operated upon a patient who apparently could not open his mouth wider than half an inch; it is, of course, a well-known fact that peritonsillitis is often associated with a certain amount of trismus.

3. *Respiration*.—Under general anaesthesia there is sometimes difficulty with the respiration, but this can be overcome by pulling the tongue and lower jaw forward.

4. *Status Lymphaticus*.—The danger connected with the condition known as status lymphaticus must not be forgotten. Harris and Packard record deaths from this cause.

5. In cases under local anaesthesia the patient may suffer from slight symptoms of cocaine poisoning (breathlessness, palpitation, and faintness).

6. *Hæmorrhage*.—Bleeding may occur at the time of the operation, especially in cases where general anæsthesia is employed, or may come on within a few hours (reactionary) or later (secondary hæmorrhage). Frequent vomiting of blood some hours after the operation shows that hæmorrhage has been going on. The most difficult points at which to arrest bleeding are (1) low down in the cavity near the base of the tongue, and (2) high up in the roof. Ard has collected eighty-five cases of alarming hæmorrhage after removal of the tonsils and adenoids by various methods. Death occurred in fourteen; in one case only did the hæmorrhage come from the internal carotid artery, but in this case the vessel took an abnormal course. The tonsillar branch of the facial artery was the source of bleeding in almost all cases. These eighty-five cases are, of course, only a small proportion of the fatal cases that have really occurred. It is advisable in every case to inquire as to hæmophilia, and if there be reason to suspect the presence of this disease, it is advisable to avoid operation, or at least to give lactate of calcium for some days beforehand. In regard to the treatment of severe hæmorrhage, the first thing is to apply pressure to the bleeding surfaces. The patient should sit up facing the light, and may be advised to clasp his hands on the top of the head. A small sponge or gauze swab wrung out of peroxide of hydrogen and held in a long sponge-holder should be pressed into the bleeding cavity. Pressure should be kept up for five or ten minutes. If the bleeding recurs we may try the effect of turpentine applied in the same way. Adrenalin is of no use in these cases. The patient should sit up as long as possible, and an injection of morphia is an invaluable adjunct to treatment. Should this fail, an attempt may be made to catch the bleeding vessel. Lothrop advises that numerous small swabs on fine holders should be used to fill the cavity left after the removal of the tonsil, and that these should be removed one at a time, so that the bleeding vessel may be seen and picked up. It is important also to retract the anterior pillar with a blunt hook in order to see the bleeding point. Special forceps have been devised by Rosenheim for ligaturing a bleeding vessel in the bed of the tonsil, but this procedure is by no means easy. If we fail to ligature the vessel, the forceps may, however, be left in position. The third method is the suture of the palatal arches. This may be done either with a curved needle in a needle-holder, or by means of steel clips and special forceps. I have not yet had occasion to use this method, but if I do I shall attach silk

thread to the middle of each clip, in order to prevent the clips from passing into the food or air passages. Various forms of tonsil compressor and clamps have been devised; one blade fits outside over the angle of the jaw, the other fits into the cavity left by the removal of the tonsil. Ligation of the external or common carotid artery is the last resource.

7. *Sepsis*.—This may manifest itself in various forms—(a) diphtheria; (b) septic infection of the cervical glands; (c) purulent otitis media and mastoiditis (Paity); (d) Parish records a case of surgical emphysema following removal of tonsils, and Stewart one of extravasation of blood into the tissues of the neck, cheek, and chest twenty-four hours after the removal of the tonsils. Pierce gives an account of a case of torticollis following enucleation; (e) nephritis; (f) septic rashes, acute articular rheumatism (Ard), chorea and endocarditis have been recorded as following tonsil operations; (g) septic thrombosis of the internal jugular vein; (h) septicaemia. Wishart records a case apparently of this nature. Dean records a case of death from meningitis following tonsillitis.

It must not be supposed, however, that hæmorrhage, cervical abscess, submucous septic œdema, &c., do not follow tonsillar infection apart from operation. Newcombe reports a case of hæmorrhage following quinsy. The common carotid artery was ligatured and the patient recovered. The same writer has collected forty-one cases of hæmorrhage in connection with tonsillar suppurations. In twenty-six of these the abscess opened spontaneously, and the hæmorrhage was fatal in fifteen; in fifteen cases the abscess was opened by incision, and eight of these patients died. As before stated, in my own cases of tonsillectomy, numbering a hundred and twenty (thirty under chloroform, ninety under local anæsthesia), I have not had any cases of sepsis, but have had two of moderately severe hæmorrhage. The local application of a sponge wrung out of turpentine was sufficient to control the bleeding on both occasions.

In conclusion, I wish to tender my thanks to Dr. Logan Turner for the great majority of the opportunities I have had of removing the tonsils by enucleation; also to the authorities of the Royal College of Physicians Laboratory for the means of doing microscopical work; and, finally, to the Carnegie Trustees for their kindness in providing the illustrations in the text.

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SOME NOTES ON THE CLASSIFICATION
OF ARTHRITIS.*

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So much confusion has arisen with regard to the nomenclature and classification of arthritis that I have no apology to offer in bringing this subject again before you.

At present in the whole range of medicine there is no other series of allied manifestations upon which a more varied nomenclature has been bestowed. Terms which in Great Britain signify one group of symptoms and pathological changes, on the Continent signify another.

From the great group of joint diseases special types have from time to time been separated out and classified. First of all, gout, then acute rheumatism, the nervous arthropathies, gonorrhœal rheumatism, the disease commonly called rheumatoid arthritis, and, lastly, infective arthritis, leaving a variety of manifestations, which for convenience we call "osteoarthritis."

Unfortunately the two groups, rheumatoid and osteoarthritis, are, in this country at any rate, being continually confused. The chief reason for this is, because in certain cases the symptoms and morbid anatomy of the two conditions appear to merge into one another, which influences a large number of authorities in believing that the two diseases are only different stages and types of the same disease.

From time to time we have had discussions on rheumatoid arthritis in this Society, but on these occasions I have never been able to determine whether the speakers were discussing rheumatoid or osteoarthritis. I do not think that I was alone in this; there were a good many others in the same difficulty.

Last summer some of us visited a neighbouring town to see among other things of interest a selection of cases of rheumatoid arthritis. There I found, in my humble opinion, the same difficulty, quite half of the cases belonging, I considered, to that group of cases which are called osteoarthritis.

All this naturally leads to endless confusion, as it is almost impossible to follow the literature on the subject until this confusion is definitely cleared away.

* A paper read before the Harrogate Medical Society.

In the first number of the *Cambridge Bulletin on Special Diseases*, G. W. Nicholson has a paper on "The Morbid History of Some Cases of Rheumatoid Arthritis," in which he fails to distinguish between cases of rheumatoid and osteoarthritis, and thus renders his interesting paper of less value.

This is not merely my own opinion, as Llewellyn Jones also comments upon it. Bannatyne, in his work on *Rheumatoid Arthritis*, also makes the same error, and writes of acute rheumatoid arthritis and the chronic or osteoarthritic type of the disease. Again, Poynton, in a paper in the *Practitioner* for April 1908, refers to the "Rheumatoid Changes Secondary to Hemarthrosis."

It appears to me that in separating rheumatoid arthritis from the "rubbish heap" of arthritic diseases a number of observers have been too greedy and have taken too large a spadeful, which has increased the difficulty.

Some authorities consider rheumatoid arthritis to be a special disease, others, like Poynton, apply the term to a large group of varied pathological changes, whilst others, again, do not recognise such a condition at all.

Classification.—From time to time various classifications have been brought forward by different authorities, and I think that, according to our present knowledge, the best of these is that of Goldthwaite of Boston. He distinguishes three groups: (1) infectious arthritis; (2) atrophic or rheumatoid arthritis; and (3) hypertrophic or osteoarthritis.

Llewellyn Jones in his recent book on the subject practically adopts this classification, with the exception that at present he is not prepared altogether to differentiate between the infectious and the rheumatoid types.

A classification to be workable must be broad and at the same time definite, so that one is able to assign a case under consideration to a special group of the classification. Again, a classification must not be too big, otherwise it will not be a workable one.

Let us begin with the following axiom, that in all cases of arthritis there is a special diathesis, a family disposition to involvement of joints, either as a special disease or during the course of another disease which, according to our present knowledge, has an entirely different train of symptoms, as, for instance, the arthropathies of nervous disease.

If we can accept this axiom it explains to us the reason why one man who contracts a gonorrhœa develops arthritis and others

do not, or why another man who injures his internal lateral ligament and semilunar cartilage while hunting in later life develops an osteoarthritis, while others under similar circumstances escape.

It is doubtful whether there is any real difference between acute and chronic types of arthritic disease. Is it not possible that the chronic forms simply depend on a smaller but frequently repeated or continuous dose of the particular toxin, or, as Ackerley suggests, "a greater personal resistance to its effects"?

The classification which I now suggest to you follows closely that of Goldthwaite.

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|------------------------------------|-----------------------|--|---|-------|---|-----------------------|---|-----------------------|
| 1. The nervous arthropathies. | { | Tabs, general paralyis, and syringomyelia. | | | | | | |
| 2. Infections. | { | A. Those depending on some infective organism itself, as acute rheumatism, gonorrhœal rheumatism, and arthritis due to other cocci, or some toxine produced in some other part of the body, as acute gout. | | | | | | |
| | | B. Those cases due to a trophoneurosis of infective or toxic origin, as rheumatoid arthritis and Still's disease. | | | | | | |
| 3. Degenerative or osteoarthritis. | { | A. occurring <i>de novo</i> . | | | | | | |
| | | B. or following. <table border="0" style="display: inline-table; vertical-align: middle;"> <tr> <td>{</td> <td>Gout.</td> </tr> <tr> <td>{</td> <td>Infectious arthritis.</td> </tr> <tr> <td>{</td> <td>Rheumatoid arthritis.</td> </tr> <tr> <td>{</td> <td>Traumatic arthritis.</td> </tr> </table> | { | Gout. | { | Infectious arthritis. | { | Rheumatoid arthritis. |
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| { | Traumatic arthritis. | | | | | | | |

I do not think that we can follow Goldthwaite in calling all cases of osteoarthritis hypertrophic, because when osteoarthritis follows on chronic gout and rheumatoid disease, as I am convinced it very frequently does, the cases are atrophic to commence with, so I think it better to avoid the term hypertrophic as applied to all cases of osteoarthritis.

With *Group 1* we will not concern ourselves, but pass on to the infectious varieties.

Goldthwaite defines "infectious arthritis" as the term "used to designate a joint disease resulting from the presence within the body of some infectious organism, the symptoms being due either to the presence of the organism itself within the joint or to some toxic agent produced by that organism in some other part of the body." Among the former, the gonococcus, pneumococcus, streptococcus, staphylococcus, the bacillus coli, &c., have all been actually demonstrated in cases of arthritis. Among those due to some toxic agent the arthritis of gout is perhaps the most common. Articular pain and effusion sometimes occur after subcutaneous injections of antitoxic sera, as that of diphtheria and plague.

Analogous symptoms or conditions are also seen in some cases of giant urticaria, where the joints share in the condition, and which are usually considered to be due to a toxæmia. We also believe that arthritis arises from such conditions as otorrhœa, pyrrhœa, leucorrhœa, dysentery, &c.

With acute rheumatism and acute gout it is not necessary to deal, and I will pass on to those other acute infective conditions and contrast their symptoms with those of acute rheumatoid arthritis.

“The resemblance each bears to the other is more marked than the difference, and yet their distinctions and differences are fully accentuated.”

The joint which is the seat of infectious arthritis in the majority of cases presents a red blush, along with marked œdema of the limb, whereas in rheumatoid it is unnaturally white or bluish-white in colour. It agrees with rheumatoid in that the joint presents the typical fusiform or spindle-shaped appearance, because in both the disease to start with is periarticular. On the other hand, in infective cases the larger joints are by preference attacked; moreover the distribution is erratic, usually attacking two or three joints and confining itself to these joints. In rheumatoid the disease attacks the smaller joints at first, and is symmetrical, progressive, and usually centripetal.

The pyrexia is greater in infective cases, and there is usually a well-marked leucocytosis followed by a secondary anemia. There may be wasting of the muscles, but not to such a marked extent as in rheumatoid. Glandular enlargement takes place more commonly in the infective forms, and the spleen is also at times enlarged.

X-Ray Appearances.—Goldthwaite maintains that in these cases there is no change in the bone or cartilage, the density of the bone being in no way lessened as long as the arthritis is not of a destructive character, in which case repair takes place, as in infection from tubercle. He also points out that the formation of new bone in these cases takes place at the point of infection wherever that is present, and not, as in osteoarthritis, at the margin of the cartilage.

The very chronic forms of infectious arthritis in which the dose of the poison is slight are represented, I believe, by that condition of joint known as fibrosis or chronic villous arthritis, and from which so many people suffer, and which I believe as life progresses tend to become osteoarthritic.

Passing on to rheumatoid arthritis, I think that the majority of us in this room are agreed that there is a special disease, but I do not think that we are all agreed as to its pathological changes and morbid anatomy.

We are all agreed, however, that the condition is due to some infection, though it does not appear to strike in the same way as in those other infective varieties. There are curious nerve manifestations which cannot be overlooked, and I am inclined to the theory advanced that the disease is of the nature of a trophoneurosis of infective or toxic origin. At the short time at my disposal it is impossible to go into this question, but in discussing the symptoms it will come up from time to time. There are a number of premonitory symptoms in this disease which we must note, viz. the presence of cramps, marked atrophy of muscles, occasional exaggeration of deep reflexes and vasomotor and sensory disturbances, which manifest themselves in many instances before the joint swelling occurs. Llewellyn Jones and others have pointed out that there are two other conditions in which much the same prodromata occur. These are tetany and Raynaud's disease. In the former the muscular cramps predominate, masking almost entirely the vasomotor changes, whereas in Raynaud's disease the converse is the case, the vasomotor phenomena being more prominent and the muscular cramps much less so. In both there are occasional joint lesions.

Tetany is generally acknowledged to be due to some form of chronic toxæmia, and many observers likewise attribute to Raynaud's disease the same etiology, viz. a trophoneurosis of toxic origin.

Turning now to the symptoms of rheumatoid disease we find that it occurs more frequently in females and in early life, and is not so common after 40 years of age. It is, however, occasionally seen in children, and I believe that the disease described by Still is rheumatoid, for as we meet with a different type of pneumonia in children, so in children do we meet with a somewhat different type of rheumatoid. The disease usually commences in the small joints of the hands, particularly in the proximal phalangeal and the metacarpo-phalangeal joints of the middle and ring fingers. The disease is symmetrical, progressive, and centripetal, passing up the limbs to the larger joints. In a large proportion of cases the cervical and temporo-maxillary joints are eventually involved. Pain is always present, and is worst at night. There is marked wasting of the muscles, which in many

cases precedes the joint affection. The extensor muscles are more particularly involved, and also the interossei. The skin over the joint is pale and of a bluish colour; it becomes atrophied, losing its wrinkles and becoming smooth and glossy. Localised cold sweating of the joint involved is also common. In some cases a curious pigmentation of the skin of the face and forehead has been observed. Tachycardia is also a common symptom.

Joint Changes.—The affected joint is first of all spindle-shaped, the disease commencing in the synovial structures; villous fringes are formed which make their way between the articular surfaces, and eventually at these points the cartilages become eroded, and finally may entirely disappear, and fibrous or bony union take place between the denuded ends of the bones. The bones gradually lose their density, become atrophied, and their articular ends absorbed, producing marked deformity. In rheumatoid disease it cannot be said that there is any definite leucocytosis; in some cases there is enlargement of the lymphatic glands and also of the ductless glands. There is slight pyrexia, more especially as fresh joints become involved.

In the acute cases the disease may do a great deal of damage in a few weeks, while in the chronic cases it may take as many years, in both instances leaving the patient with a number of permanently damaged joints. The deformities and dislocations are produced by muscular spasm, along with the atrophy of cartilage and bone.

The disease eventually exhausts itself; this may happen in a few months, or it may take ten, twelve, or even twenty years. As the disease exhausts itself some authorities consider that Nature tries to assert herself by attempting to repair the bony damage. This Nature may do in a very limited number of cases and to a very small extent, or the modified new bone outgrowths may be due to a secondary condition, namely, osteoarthritis.

Before going into this point it will be well briefly to comment on the symptoms of osteoarthritis, and return to the question of the presence of bony outgrowths in rheumatoid disease.

Osteoarthritis is a disease of the middle and later periods of life. It is rare under 40, though a few cases have been reported as occurring in children, but it is questionable if these were not of a tubercular nature. Its onset is insidious, slow, progressive, and apyrexial. The patient is usually well nourished, there are no trophic disturbances of the skin, no vasomotor phenomena, no localised sweating, and no enlargement of lymphatic glands.

Among the smaller joints the terminal phalangeal is more prone to be affected. The appearance of the joint is never spindle-shaped, but is irregular in outline from bony outgrowths and nodes of Heberden. The joints tend to get larger, while in rheumatoid they tend to get smaller. The hand is warm and the skin of normal colour.

Morbid Anatomy.—Changes take place first in the bone and cartilage, the synovial tissues being only secondarily involved. The cartilage cells proliferate and are set free into the joint cavity, and the opposing cartilages become worn away and the denuded ends of the bone appear. Where the pressure is less marked the cartilage, instead of being thinned, becomes thickened, its proliferating elements forming irregular crests or nodules, which eventually become ossified. These overgrowths or eburnations cause the deformity of the joint and prevent its mobility. Displacements of the bones from their normal axis is usually lateral, and is due to the mechanical thrust of the bony outgrowths, and is in no way due to muscular spasm.

Etiology.—At present no definite cause can be assigned to this disease. There is some relation between osteoarthritis and arteriosclerosis. Hoffa and Wollenberg, Painter and Erving have found endarteritis obliterans and narrowing of the lumen, owing to thickening of the vessel walls of the fine arterioles in joints affected with osteoarthritis.

Again, we frequently notice the occurrence of this disease in the knee-joint of women at or near the climacteric. One wonders if it has any relation to the withdrawal of the secretions of the ovary and thyroid from the general system.

Osteoarthritis also appears to follow in joints after repeated attacks of interarticular hæmorrhage in the hæmophilic, after chronic gout, infective arthritis, rheumatoid arthritis, and injury to joints, as represented by the non-articular form.

A. E. Garrod sums up the etiology of osteoarthritis well when he says "it is indeed a reasonable view that the osteoarthritic lesions are in no way specific or due to any one morbid cause, but that they are rather a set of degenerative changes which may develop in joints, and especially in those which have received injury, or again in joints which have been the seat of disease, and especially of long-standing disease. This is perhaps the easiest explanation of the presence of such lesions in gouty joints, in the damaged joints of bleeders, as well as in articulations which have been the seat of obstinate attacks of gonorrhœal rheumatism or rheumatoid

arthritis," and in the same paper he goes on to mention the hip-joint affections of elderly people and the knee-joint changes in women, which develop about the time of the menopause, as excellent examples.

In discussing rheumatoid disease I questioned the occurrence of any definite bony outgrowth taking place in the course of the disease, even of a reparative nature, and what I think will be eventually agreed upon is, that once the rheumatoid condition has practically exhausted itself there is a great tendency for osteoarthritis to develop if the patient is over 45. Garrod also believes that a case of long-standing osteoarthritis may have an acute attack of rheumatoid super-imposed upon it, and he compares the two diseases to acute nephritis and granular kidney.

On the other hand, in the recent discussion at the Royal Society of Medicine, Llewellyn Jones pointed out that, in considering the question of the possibility of any transition of rheumatoid into osteoarthritis, the fact that these two diseases possess, each of them, a distinctive clinical facies had been overlooked, and went on to remark that it is an unscientific attitude to pursue, as, in order to substantiate this view, that a condition of rheumatoid may pass into one of osteoarthritis, it would be necessary that a case of rheumatoid should put on the general aspect of a case of arthritis—in other words, the emaciated rheumatoid should assume the appearance of the well-nourished and but too often obese osteoarthritic, and he doubted if he has ever come across such a case. Is such a change as Jones mentions necessary? If the patient is emaciated from long suffering, sleepless nights, and the exhausting progress of the disease, is it likely that he will alter his clinical characteristics if osteoarthritis gradually develops?

Granted that in some cases of rheumatoid disease a certain amount of bony outgrowth does take place, we must recognise that it is very much modified as compared with what takes place in a case of osteoarthritis which has occurred, or subsequent to some other joint irritation of long standing. The numerous skiagrams of Strangeways and Burt* show this, the new bone consisting for the most part of Bruce's nodes on the shafts of the bone, and in a few instances small spicules at the margin of the cartilages, not in big bosses and eburnations, and in none of their cases do they show Heberden's nodes.

What, then, are the theories advanced for these modified bony

* *Cambridge Bulletin of Special Diseases.*

outgrowths? Jones suggests that as these atrophied joints are peculiarly liable to stresses and strains brought to bear upon them, the ends of the bones tend to undergo plastic adaptations in their shape as the result of the traction of the skin and periarticular tissues, aided by the pull of the related muscles, but this does not explain the presence of Bruce's nodes, which occur on the shafts of the bones.

Hoffa states that the bony proliferations are in proportion to the amount of atrophy that has occurred, and he regards them as reparative in character; but we would expect that these proliferative changes would have some relationship to the duration of the disease. On the contrary, it appears that, notwithstanding the existence of the disease, for many years bony outgrowths are in many cases entirely absent, whereas in others of much shorter duration slight bony proliferations have been noticed.

I believe that in rheumatoid arthritis there is seldom, if ever, bone proliferation as a result of that disease, but what happens is that once the patient suffering from rheumatoid reaches the age when arteriosclerosis and osteoarthritis tend to make their appearance, osteoarthritis in a modified form is very apt to follow. The same, I believe, takes place in gout, hence the difficulty that has been experienced in differentiating between the skiagrams of late gout and late rheumatoid disease without the clinical histories.

I do not want to trouble you with the reports of numerous cases, but will just mention one which I have watched carefully for the last three or four years.

The patient is a female, now aged 52, and the disease commenced gradually seven years ago, attacking the feet, right knee, and right hand. The joints of the right hand were affected in the following order: the proximal interphalangeal joint of the middle finger, then the proximal interphalangeal joint of the ring finger, the metacarpo-phalangeal joint of the index finger, and subsequently the proximal interphalangeal joint of the little finger, and the wrist joint. Since then the shoulders and both knees have become involved, and there is also pain in the cervical spine. In the summer of 1908, as a result of treatment and a generous diet, she commenced to put on flesh, her weight increasing by nearly a stone, and in the autumn of the same year the acute pain subsided. Each year progress has been made. In the summer of 1909 I took an X-ray photograph of the right hand, which shows atrophy of cartilage at the proximal interphalangeal joints of the index, middle, ring, and little fingers, with



Showing loss of cartilage at interphalangeal joints of index, middle and ring fingers; partial dislocation of same joints of middle and ring fingers. Bruce's nodes on shafts of proximal phalanges, first, second and third fingers. Destruction of joint between os magnum and unciform.

some slight dislocation of that of the middle finger. There are Bruce's nodes on the shafts of the proximal phalanges of the four fingers. The patient was in Harrogate in the earlier part of last season, and with the exception of some pain in the joints of the left hand was doing well, but during the late autumn she suffered considerably from pain in the left hand. I heard from her a few days ago, and the pain has practically gone. I asked her to see Dr. Thurston Holland of Liverpool, who kindly took two skiagrams for me. That of the right hand shows that there is now dislocation of the interphalangeal joint of the ring finger and destruction of the joint between the os magnum and unciform. I think also that the Bruce's nodes are somewhat larger. The left hand also shows atrophy of the cartilages of all the proximal interphalangeal joints, including that of the thumb, some Bruce's nodes, and destruction of the joint between the os magnum and the unciform.

You see, then, that in this case also, which has been going on for the last seven years, that the bony growth is slight, being confined to the Bruce's nodes on the shafts of the proximal phalanges.

I hope from time to time to be able to go on taking skiagrams of these hands, to see if in the future any definite deposit of new bone takes place at the joints themselves. To arrive at a definite conclusion on this point, cases must be carefully watched for some years, and all changes observed recorded by a series of X-ray photographs.

There is one other point which I should like to bring to your notice. If osteoarthritis tends to develop in those chronic cases of rheumatoid arthritis when the patient is past the middle period of life, and if osteoarthritis is in any way akin to arteriosclerosis, then it appears to me that, once the acute symptoms have subsided, it will be necessary for us to change our advice with regard to diet, going back to the older plan of limiting animal proteids.

I do not know how the Germans diet their patients with chronic rheumatoid, but it is worth noting that in the reports of all the post-mortems I have been able to collect from German sources in none of them was any bony outgrowth found, though the duration of the disease extended in some cases to thirty-two years, and the ages of the patients varied from 44 to 73.

I have endeavoured to convince you that these are two distinct diseases, rheumatoid and osteoarthritis; that in rheumatoid disease bone repair does not occur, but that a modified type of osteoarthritis is very apt to follow in chronic cases of long standing, where the patient is past the middle period of life.

OPERATIVE TREATMENT OF VARICOSE VEINS.

By ARTHUR B. MITCHELL, M.B., B.Ch., F.R.C.S.,

Surgeon, Royal Victoria Hospital, Belfast.

It is now generally recognised that in order to obtain a satisfactory and permanent result in varix of the lower limb it is necessary to remove the entire internal saphenous vein.

The following operation has been carried out by me for the past twelve years, and the result has been entirely satisfactory. My oldest patient was 60 years. He himself demanded operation owing to a painful ulcer and eczema. The result was very gratifying. He was back at his business in one month, and called on me six months later to show me the leg and express his gratitude for relief after years of suffering. The steps of operation are as follows:—

1. An incision about 1 to $1\frac{1}{2}$ ins. long is made transversely just below the saphenous opening, and the internal saphenous vein secured.

2. The vein is clamped between two pairs of artery forceps and divided; an iodine catgut ligature is applied to the proximal end of the vein and the upper pair of forceps removed. This is the only ligature used throughout the operation except in very unusual circumstances.

3. By pulling on the forceps attached to the distal end of the vein the line of the vessel beneath the skin is easily located by the index finger of the other hand.

4. This having been done, another short incision (which need not exceed 1 in. except in very stout persons) is made 4 or 5 ins. down the thigh, according to the strength of the vein or other indication. The vein is again picked up, clamped, and carefully isolated; this latter is best done by an ordinary dissecting forceps. Great care must be taken that the vein alone and no connective tissue is grasped in the clamp forceps. By drawing alternately first on upper and then on the lower pair of artery forceps the vein is made to run freely up and down under the skin. The upper forceps is then removed and the intervening portion of vein slowly and steadily pulled out. Care must be taken not to twist the vein, otherwise it is very apt to break off.

Any radicals entering this portion of vein are of course torn across, but no attention is paid to them—they never cause noticeable bleeding.

5. The loose portion of vein is now cut off. The process is repeated, the vein secured further down the thigh and the intervening piece pulled out, and so on till the knee is reached. The small incisions in the thigh are next sutured, and sealed by a mixture of equal parts of Tr. Benz. Co. and flexile collodion so as to prevent infection during operation on the leg.

6. Below the knee the incisions are generally vertical and rarely exceed $\frac{1}{4}$ to $\frac{1}{2}$ in. in length, but are much closer together owing to the numerous radicals to be dealt with. Several incisions are made and numerous pairs of forceps are applied before any attempt is made to extract the segments of vein. The enlarged veins are followed in every direction, so that there may be several lines of incision on the calf of the leg.

In this way the vein is dealt with right down to the ankle. It is to be noted that below the knee the veins lie very close to the skin. The little incision is therefore made very carefully. The first cut does not go completely through the skin; its edge is picked up in dissecting forceps and the wound completed without injuring the vein. An aneurysm needle or blunt director is then used to free the vein, by one or two strokes up and down the fascia of the leg. The segments between the different pairs of forceps are then drawn out by a series of slow steady pulls, always avoiding any sudden jerk or twist, either of which will inevitably result in a breaking off of the vein. Should this accident happen, the intervening segment must on no account be left. A fresh incision midway between the other two should at once be made and the injured portion removed. Such pieces, if left behind, almost invariably become the seat of thrombosis and require subsequent removal.

The last forceps to be removed is that just above the ankle. No ligature is required on the lower end of the vein—the pressure of the bandage suffices to prevent any bleeding. The incisions below the knee being very short and vertical, are effectively closed by the bandage. If, however, for any reason the incisions are longer than half an inch, it is better to insert a suture so as to secure accurate union.

A firm bandage having been applied over sterile gauze, the patient is returned to bed without any splint. If both legs are affected, both are operated on at once, an assistant taking one leg. The dressing is not removed till the end of a week, when any sutures are removed. The limb from the foot up is then smeared with a coating of Unna's zinc ichthyol gelatin, over which a bandage is carefully applied, so as to secure steady uniform

pressure, which effectually prevents edema when the patient gets up on the tenth day, two weeks being the usual time in hospital. The advantages claimed for this operation are:— (1) The complete removal not only of the internal saphenous vein but of any varicose tributaries. (2) The absence of ligatures, which not only occupy much time in their application, but are liable to be a source of infection or irritation by involving nerve filaments. (3) Minimum damage to the skin owing to the short incisions. (4) The rapidity and smoothness of recovery. (5) The permanency of relief.

It is not contended that all cases can be dealt with in this manner.

Where veins are thrombosed and adherent, longer incisions must of course be made and the ordinary excision carried out. We plead very earnestly, however, for the shortest possible incision consistent with thorough work. Anyone who has noticed the broad ribbon-like appearance of a long vertical incision in the leg some months after healing cannot fail to be convinced that it is a thing to be carefully avoided.

At first I avoided operating on cases complicated by ulcer until the ulcer was healed. This I no longer do. A week or ten days is occupied in getting the ulcer into as healthy a condition as possible. The ulcer is then painted with pure carbolic acid and the vein removed. Nothing is more striking than the rapidity with which such an ulcer heals once the vein has been got rid of.

Figs. 1 and 2 show a case before operation, and two weeks later. The portions of vein removed from this patient measured 40 ins. in length. I do not, however, usually attempt to remove the vein in one piece, owing to the risk of infection by drawing the long loose piece through the tissues.

The operation above described is so simple that it may very likely have occurred to many other operators; but I am not aware of any description of it, and I have seen no other surgeon carry it out on the same lines.



FIG. 2. Same leg 2 weeks after operation.



FIG. 1. Leg before operation.



CLINICAL RECORD.

A RARE CASE OF FRACTURE OF THE ASTRAGALUS.

By G. C. ANDERSON, M.D.,

Medical Superintendent, Randolph Wemyss Memorial Hospital.

THE following case of fracture of the astragalus is, I believe, very rare, if not unique, and one which I think is interesting to report.

One day I was called to see a man who had sustained an injury to his ankle. At the time of the accident he was standing upon a ladder doing some joinery repairs, when the ladder slipped and he fell to the ground. The ladder was leaning against a wall above an open doorway, and when the bottom of the ladder slipped the top part which rested against the wall fell through the open doorway. The patient's foot was caught between two rungs, the toe of his boot catching in the upper while the heel was caught in the lower. Losing his balance he fell backwards, the ladder at the same time falling forward. He was then carried by his fellow-workers to an adjoining shed, where I saw him.

The foot was very much swollen, the swelling being chiefly on either side of the tendo Achillis, while the tendo Achillis itself was unduly prominent. There was also puckering of the skin on the external aspect of the foot just over the malleolus. At first glance the injury resembled a backward dislocation of the ankle joint.

The man was removed to the Randolph Wemyss Memorial Hospital, where I took the accompanying radiogram, which shows a complete fracture of the astragalus with wide separation of the two fragments.

I removed the posterior fragment, and although the recovery was retarded by a virulent staphylococcal infection invading the whole joint, the man has now a firmly ankylosed joint, and the limb bids fair to prove a very useful one to the patient.

OBITUARY.

P. H. MACLAREN, M.D.

ALTHOUGH Dr. Maclaren had not for some years been engaged in the active work of practice, his removal by death none the less creates a felt blank in the profession in Edinburgh.

Many who were familiar with the face and figure, which the passing years seemed to touch so lightly, have been surprised to learn that he had passed the allotted span of life, and so truly was the outer man an embodiment and index of a buoyant and youthful spirit that

the impression conveyed by it was a just one. In some measure this characteristic was due to strength of constitution and the enjoyment of good health. In spite of recurring and serious illnesses during the past few years, Dr. Maclaren returned to town last autumn in excellent health and spirits, and was making plans for a stay in the south of France when in February his former symptoms returned, and after weeks of illness, borne with extraordinary patience, hopes of recovery were frustrated by an attack of erysipelas which exhausted his remaining strength, and on 20th May he passed peacefully away.

An Edinburgh man by birth and education, Dr. Maclaren entered upon the study of medicine at a period in which the school here was made famous by the presence of such teachers as Simpson, Syme, and Goodsir.

After graduating as Doctor of Medicine in 1857, and acting as house surgeon to Professor Spence, he spent some months in Berlin, attracted thither by the fame of Virchow, Traube, and Langenbeck, there, as also later at home, in association with Professor Spence and Mr. Struthers (afterwards Sir John Struthers) devoting himself zealously to surgical work.

He had, before going abroad, acted for a time as assistant in practice in Forfar, and, on returning, again engaged in practice in the country, settling in Lasswade, where he worked for about fifteen years.

This was, and in retrospect remained, a most happy period in his life. He was appreciated and beloved by patients of every class of the community, and formed friendships which endured throughout his life, and founded a connection which stood him in good stead when in 1877 he ultimately returned to Edinburgh. In Lasswade it was that he met his wife, the daughter of Mr. Amundale of Polton and West Barns, with whom he enjoyed a singularly happy home life and unity of interests, and to whom in her sorrow now there has come from many testimony to the affectionate remembrance in which they still hold the old days in Lasswade. As surgeon to the Edinburgh County Militia Dr. Maclaren served for years, and retired with the rank of Surgeon-Colonel.

Shortly after his return to Edinburgh in 1877 Dr. Maclaren obtained the appointment of assistant surgeon in the Royal Infirmary, and so was enabled to realise his earlier ambition to do surgical work. Becoming in due course surgeon in charge of wards, he was a successful and popular clinical teacher, always succeeding in giving students a broad and philosophical presentation of his subject. One of the last Edinburgh general practitioners to occupy this position in the hospital, his teaching derived from his less specialised experience a characteristic distinction and value which many of his students have realised increasingly as the years have passed in the work of practice. The work for which he has been best known and will be remembered in the profession



DR. P. H. MACLAREN.

was done in connection with his occupancy of the charge of the Lock Hospital, and his *Atlas of Diseases* and published pamphlets were in their day authoritative in this department of medicine.

In 1900 Dr. Maclaren retired from practice, to the great regret of his numerous and attached patients; they were for the most part members of the most influential section of the community, and his relations with them were the happiest possible. Possessed of a sound judgment and with a remarkable gift of knowing and managing men, he won their confidence most completely, and reassured the sick not less by his hopefulness of outlook and the wholesome and cheerful feeling his mere presence in the sickroom inspired, than by the impression of strength conveyed by his manner in presence of grave illness. They had in him a friend and counsellor as well as a doctor.

In 1894 Dr. Maclaren was elected President of the Royal College of Surgeons, and filled the chair for the customary period of two years with much acceptance.

During the years that have elapsed since his retiral from practice he found abundant opportunity for work and scope for influence. As one of the Managers of the Infirmary he evinced a warm interest in the modern developments of surgery, and was a useful and influential member of the Board. He was also a Manager of the Royal Hospital for Sick Children and of the Edinburgh Royal Asylum for years, and as a Manager of the Orphan Hospital interested himself in the welfare of its inmates—children of the working class.

During some twenty years he was the Principal Medical Officer of the Caledonian Insurance Company, of which he had previously been a director, and for this work he was singularly fitted in virtue of his knowledge of men and affairs: he relinquished this appointment in the year 1908. Until the end of his life he was the Principal Medical Officer of the Commissioners of Northern Lighthouses, and took special pleasure in the duties of this office.

But a man is greater than his work, and no true impression of the subject of this notice would be left upon the mind were nothing said of his native kindness of disposition, his remarkable shrewdness, his keen sense of humour, his mother wit. All his work was distinguished by balanced judgment and strong common sense. He had very remarkably the faculty of sympathetically appreciating and understanding his fellow-men; to these qualities much of his success as a doctor and a teacher was due. His students learned much from Dr. Maclaren besides surgery, and his patients found in him more than a mere doctor.

Buoyant in mind and possessed by a most contagious gaiety of spirit he was the best of companions on any convivial occasion, and by his unfailing cheerfulness and readiness in anecdote he secured the success of many a social evening, such as those of the Medico-Chirurgical Club, of which he was a member.

His interests outside his professional activities were many and various: nowhere happier than on the moor or by the river, he was an excellent shot, and in later life became a keen golfer, the social advantages of the game appealing to him strongly. The world of books held an equal pleasure for him, and his taste in reading was catholic. Balzac and other authors depicting the Comedy of Life afforded him constant amusement and pleasure, but indeed there seemed few topics which did not stir his interest and stimulate his mind.

A most likeable man who through a long life kept his heart young and brought his qualities of cheerfulness and courage to the service of others, he will be missed by many, and ever held in kindly remembrance.

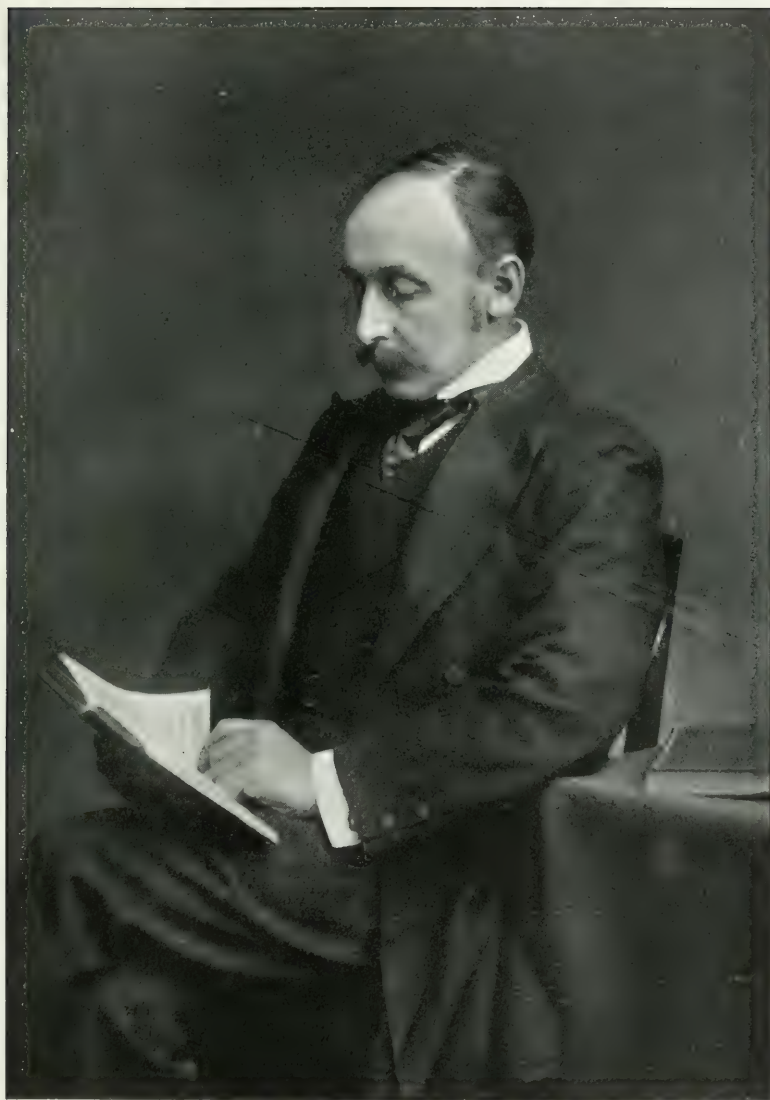
K. M. D.

ALEXANDER BRUCE, M.A., M.D., LL.D., F.R.C.P., F.R.S.E.

THE Edinburgh School of Medicine, and indeed the larger world of scientific medicine, has sustained a severe blow in the death of Dr. Alexander Bruce. He was an integral part of the living working school. When old Edinburgh men foregathered and the familiar question "How goes Edinburgh?" had passed round, another question commonly was, "And Bruce as hard at it as ever"? It was he largely who gave to Edinburgh her distinctive place in neurology. He was one of the men inquired about by strangers who knew Edinburgh from the distance. It seems but a few weeks since we had him amongst us in good health. Last summer when his friend, V. Y. Bowditch, was over from Boston we had several merry meetings. In parting, "Au revoir" was the word, without a thought of this.

Alexander Bruce was an Aberdonian—a typical Aberdonian. Born at Ardifferry, Cruden, in 1854, he was educated at the Gymnasium, Old Aberdeen, and subsequently at King's College, Aberdeen. With the inborn qualities of tenacity and thoroughness, characteristic of the sons of Buchan, Bruce used his opportunities to the best advantage. In both the class-room and the field he was conspicuous from the first. He was captain of the Rugby fifteen, and passed from school to the university as first bursar. He left the university with flying colours. His headmaster at school, Rev. Dr. Anderson ("Govie"), regarded him as one of the ablest pupils he ever had, and the grand old classic of Aberdeen University, Sir William Geddes, spoke of Bruce's adoption of a scientific career as a grave loss to classics.

In turning to medicine, Bruce was attracted by the fame and larger opportunities of the Edinburgh School. He came south in 1874. The hard-working Aberdonian was quickly a marked man. The lists of the university during the succeeding four years bear eloquent testimony to



DR. ALEXANDER BRUCE.

the stuff of which he was made. The crowning point of his medical course was the award of the Ettles Scholarship—the highest honour of the year. Then followed a course of study abroad—Vienna, Heidelberg, Frankfort, and Paris—and a rapid succession of appointments at home—the Royal Infirmary, Edinburgh, and elsewhere.

Settling in Edinburgh, he devoted himself to the life of the physician, which was his great ideal. He emerged quickly from general practice and plunged, with that undividedness of interest which was a leading characteristic, into pathological and neurological research. He early became Lecturer on Pathology at Surgeons' Hall, and Pathologist to the Royal Infirmary, the Royal Hospital for Sick Children, and Longmore Hospital for Incurables. He thus obtained access to a wealth of material which he knew well how to use. Not a few difficult chapters in medicine were enriched and clarified by his labours.

When promoted to the position of Physician to the Royal Infirmary and Lecturer on Clinical Medicine, he brought to the problems of the bedside an uncommon store of exact knowledge, physiological and pathological. He was in the best sense a learned physician. Fortunately for his students and his patients, his learning remained fluid and ready of application. Accuracy of clinical observation he demanded from his students as he demanded from himself. Often he would lament the declension of self-training in the clinical wards of the Infirmary. He yearned to see men soak themselves in the clinical material.

Amidst a busy life among patients and students he seemed always at leisure for research. His contributions to the literature of medicine are well known. They include *Illustrations of Mid and Hind Brain*, *A Topographical Atlas of the Spinal Cord*, and a great number of papers on the histology and pathology of the brain and cord. He founded and edited the *Review of Neurology and Psychiatry*. The journal was a labour of love, and to make it a success he sacrificed both time and means. He was the translator into English of Thoma's *Manual of Pathology* and Oppenheim's *Text-Book of Nervous Diseases*. The last he undertook contrary to the advice of friends, at a time when he ought to have been husbanding his strength and resting from his labours. It was in the midst of this that his health gave unmistakable evidence of failure.

Work was the passion of his life. He did not seek for honours. The honours which came his way came spontaneously. Apart from the early successes to which allusion has been made, he received appreciative recognition in many directions. He was awarded the Cullen Prize, in the gift of the Royal College of Physicians, Edinburgh, "for the greatest benefit done to practical medicine," dividing the prize with the late Mr. Lawson Tait. The Royal Society of Edinburgh awarded him the Keith Prize for his communication on "The Distribution of Cells

in the Inter-Medio-Lateral Tract of the Spinal Cord." Some years ago he was nominated a corresponding member of the Neurological Society of Paris. The University of Aberdeen conferred on him the honorary degree of LL.D. in 1909. He was an elder of St. Cuthbert's Parish Church, and medical adviser to the Scottish Widows' Fund Life Assurance Society.

His private life was simple, quiet, cheerful. His qualities of heart were no less esteemed than his qualities of head. A numerous band of friends were deeply attached to him. He enjoyed the social board with congenial company. Whether as host or guest he made things go brightly. How wonderfully the interesting face with its reserve, bordering on solemnity, would light up with a smile or with the play of humour! He enjoyed a good story, and he told one well, his serious features and language only adding zest.

If he worked hard it was not because he could not play. Years ago, one lovely morning in June, I remember our going round the Balgownie golf links, redolent with the scent of gorse and thyme—a perfect summer day. As he pressed the turf with fondness, "We should do this once or twice a week" was his eager cry. He dearly loved the country. He shot, he fished, and he tramped when he found time.

The difficulty was to find time. *Ars longa, vita brevis!* His strenuous life and his early death serve sadly to underline the familiar words.

In his home he was very happy. An Aberdonian in Edinburgh, he returned to Aberdeen for his bride. It is but a year or two since the silver wedding came round, and at his own table, to a small party of particular friends, he told of twenty-five years of continued happiness, and how he owed them to his wife. Along with her he has left three sons and two daughters. It was a source of gratification to him that his eldest son, Ninian, elected to study medicine, and, before the parting came, had completed his undergraduate curriculum with distinction.

On Thursday, 8th June, Edinburgh restored to Buchan the mortal remains of her adopted son, crowned with laurels. He was followed to the grave by his three sons and a crowd of mourners, and was laid to rest by loving hands in the family vault beneath the old church of Longside. The whole country seemed in mourning as the village scholars lined the roads, and over the mansion-house of Inverquhomery the flag floated half-mast. The burden of sorrow which his premature death has brought to his home is shared by many friends, by the Edinburgh school, and by medical science all the world over.

R. W. P.

MEETINGS OF SOCIETIES.

Edinburgh Medico-Chirurgical Society.

A MEETING was held on 3rd May, Dr. Byrom Bramwell, President, in the chair.

Mr. J. W. Dowden showed a useful and inexpensive form of artificial arm.

Dr. J. S. Fraser read a paper on the "Faucial Tonsils, with Special Reference to their Removal by Enucleation" (see p. 30).

Dr. Logan Turner said it was difficult to say when a tonsil was dangerous and when it was serving a useful purpose. The larger tonsils were probably the safest. A discussion on the upper air-passages as channels of infection might be of great value. He advocated the use of the guillotine for the removal of enlarged tonsils in children. In cases with enlarged glands the glandular enlargement disappeared after the use of the guillotine, and these children remained well for a large number of years. In adults with recurrent quinsy or toxic symptoms it was no use to slice away parts of the tonsils, owing to the depth of the crypts. His rule was therefore to use the guillotine in children unless the tonsils were tubercular, and in adults to enucleate. If the enucleation were complete there should be no trouble from hæmorrhage. He applied insufflations of orthoform to the stumps.

Dr. Elliot said that the snare was to be preferred to scissors. Enucleation was superior in all cases to the guillotine.

Dr. Porter said that the operation was simple if the right depth were struck. This might be effected by grasping the anterior pillar with a vulsellum. The guillotine was so simple that it should be chosen where possible.

Dr. Lithgow advocated the use of the punch in removing remains of the tonsils.

Mr. Struthers said that $\frac{1}{2}$ per cent. novocain was a sufficiently strong anæsthetic.

Mr. Dowden referred to the method sometimes employed by the late Professor Ammandale. The tonsil was pressed into the mouth from the outside and was scraped away with a sharp spoon.

Dr. Price gave a lantern demonstration on the diagnosis of urinary calculi by means of the X-rays.

Dr. Dawson Turner referred to the rapidity with which ureteric calculi might change their position.

Mr. Dowden read a paper on "Personal Experiences in the Use of Salvarsan."

Dr. Thyne said he had seen symptoms of arsenical poisoning as the result of four intramuscular doses of 0.4 grm. doses at intervals of a fortnight.

Mr. Wade said he had had very good results in the treatment of out-patients with salvarsan.

Dr. Logan Turner said that he had seen remarkable improvement in syphilitic affections of the mucous membranes. There was no benefit in lupus of the pharynx and larynx.

Mr. Wilkie suggested that the reaction which sometimes occurred might be due to the liberation of toxins from the killed spirochaetes. Fomentation of the lesions might be of benefit in allowing the drug to reach the spirochaetes.

The President asked about the drug in leukoplakia and in parasyphilitic lesions, and thought that in these conditions several injections should be tried.

A meeting was held on 7th June, Dr. Byrom Bramwell, President, in the chair.

Mr. Cathcart showed a patient after laparotomy for a ruptured spleen due to bruising with a cart wheel.

Drs. Chalmers Watson and James Miller showed the liver and spleen from a case of acute leukæmia. The patient was a man, aged 40. The terminal symptoms were sighing respiration and marked anæmia, and a diagnosis of ruptured abdominal aneurysm was made. On post-mortem examination the abdomen was found to be full of blood from the rupture of a large hæmorrhagic tumour of the liver and spleen.

Drs. Chalmers Watson and Drennan showed the brain of a boy, aged 12. There was a large hæmorrhage into the ventricles. The symptoms had suggested tuberculous meningitis.

Dr. Chalmers Watson showed microscopic specimens of the thyroid gland from a series of rats fed on a rich purin diet. The thyroid gland was very much larger than in the case of check animals.

Mr. Rutherford Morison read a paper on "Intestinal Obstruction," which will appear in the *Journal*.

Mr. David Wallace read a paper on "Enlarged Prostate Associated with Vesical Tumour," which will appear in the *Journal*.

RECENT LITERATURE.

CRITICAL SUMMARIES AND ABSTRACTS.

MEDICINE.

By W. T. RITCHIE, M.D., F.R.C.P.

THE ACTION OF DIGITALIS.

WITHIN the last two years there have been a number of important contributions dealing with the effect of digitalis upon the heart and blood-vessels. Using our present methods of analysing the heart's action, James Mackenzie, G. A. Gibson, Wenckebach, Cushny, Windle, Norris, Edens, and other investigators have studied the effects of digitalis upon the stimulus production (rhythmicity), excitability,

contractility, conductivity, and tonicity of the heart. In the present paper only a short summary can be given of the more definite and important conclusions that may be drawn from those observations.

Cushny, recording the joint observations made by himself and Mackenzie in the latter's clinic, distinguishes two great groups of cases with heart failure:—I. Those in which the dominant rhythm of the heart continues to originate in the normal point (the sino-auricular node). II. Those in which the rhythmogenic function is usurped by some other part of the heart. The effects of digitalis are markedly different in these two groups of cases.

I. *Cases in which the Heart is Responding to a Sino-Auricular Rhythm.*—The general condition of cases in this group is stated by Cushny to be considerably improved by digitalis, the benefit being manifested in relief of dyspnœa, or of dropsy, or in lessened cyanosis.

1. *Stimulus Production.*—Cushny states that in about 30 per cent. of cases the general improvement in the patients' condition was accompanied by a moderate slowing of the pulse-rate—from 90-110 to 70-80 per minute. The lessened frequency of the pulse is due to fewer impulses being emitted by the rhythmogenic area in the sino-auricular region of the heart. There are three reasons for attributing the slowing of the heart under digitalis to stimulation of the inhibitory centre in the medulla—(a) The rhythm of the slowly beating heart varies with the phases of respiration, being quicker during inspiration and slower during expiration, as it does in normal individuals with marked inhibition. This form of sinus arrhythmia may become very obvious when the patient is fully under the influence of digitalis, and, moreover, the arrest of the whole heart by inhibition may be of such duration as to excite syncopal, or even convulsive, seizures, as in Laslett's case. (b) The slowing disappears while the patient is under the influence of atropin, which prevents inhibitory impulses reaching the heart. (c) The ventricular frequency in cases of complete heart-block is not lessened by digitalis, as one would expect if the drug retarded the heart by direct action upon its musculature.

When digitalis does not lessen the heart's rate, Cushny concludes either that the centre in the medulla is incapable of stimulation, or that the resistance of the heart to the maximal activity of the centre is so great as to render nugatory the increased activity of the inhibition induced by digitalis. Such resistance to inhibition is pronounced in cases of fever, and more particularly when there is active myocarditis with consequent increased irritability of the heart.

2. *Excitability.*—In animal experiments small doses of digitalis decrease the excitability of the heart; and Wennekebach, using small therapeutic doses, finds that digitalis regulates the heart splendidly, diminishes excitability, and prevents extra systoles. In larger doses digitalis increases the excitability of the heart muscle, and this change may be manifested clinically by the onset or increased frequency of

extra-systoles. Cushny finds that extra-systoles are often elicited in patients under full doses of digitalis, even although the heart's rate is not retarded, and he regards the augmented irritability as unquestionably the result of the direct action of the drug upon the muscle. Holst likewise states that the drug may induce extra-systoles, and in one case they disappeared while the patient was under the influence of atropin. Edens found that digitalis given intravenously increased the number of extra-systoles, whereas the drug, when given by the mouth, led to their disappearance in some cases.

3. *Contractility*.—According to Cushny, it is impossible at present to demonstrate that digitalis directly improves the contractility of the heart muscle. The apex-beat may be considered stronger and the pulse beat larger, but no satisfactory methods of measuring these have yet been devised. The rate of the heart is often slower, and this alone will strengthen the contraction of the heart and increase the amplitude of the pulse, apart from any direct increase of contractility. In some patients, however, with impaired contractility, as manifested by the *pulsus alternans*, this impairment may be intensified under the influence of digitalis. Cushny suggests that this effect may be due to the drug increasing the contraction power of the heart muscle without a corresponding effect upon the restorative function. Even although digitalis should depress the contractility of the heart muscle, the patient's condition may nevertheless improve, possibly because, as Mackenzie suggests, the drug had materially improved the tonicity of the heart. Moreover, depression of contractility is not invariably intensified by digitalis. Edens records the disappearance of the *pulsus alternans* after digitalis had been administered. The beneficial effect in similar cases is probably to be ascribed, at least in part, to the slowing of the heart and the coincident increased power of contraction.

4. *Conductivity*.—In cases with defective conductivity of the auriculo-ventricular bundle, as indicated by prolongation of the interval between the auricular and ventricular contraction, digitalis may lead to still further depression of conductivity. Some of the sino-auricular stimuli may fail to reach the ventricles, and a state of partial heart-block is then established. This failure of conductivity is usually ascribed to the inhibitory action of the drug, and has been observed to disappear under atropin, which removes the inhibitory action of the cardiac vagus. Cushny is not satisfied, however, that this is the sole explanation, for in animals, when complete digitalis heart-block is induced, the block is independent of inhibitory action, and continues after large doses of atropin have been given. He therefore suggests that digitalis heart-block in man is due partly to a direct action of the drug on the auriculo-ventricular bundle and partly to inhibitory action.

In most cases of impaired conductivity the use of digitalis is contra-indicated lest a partial heart-block be induced. Hare says that if, in addition to impaired conductivity, there is a jugular pulse

synchronous with ventricular systole, digitalis is still more clearly contra-indicated, as the drug will impair the action of the left auricle and will still further distend it by stimulating the right ventricle. If given at all, the dose of digitalis must be so small as to produce a very gradual effect and not to decrease the auricular contractions through vagal stimulation.

5. *Tonicity*. — In experimental work digitalis lessens the relaxation of dilated hearts. Wenckebach, however, states that, although digitalis acts wonderfully in cases of valvular disease with cardiac dilatation, we have no right to ascribe the improvement to a specific influence on the tone of the heart muscle. The good effects of digitalis may be explained on other grounds. Cushny likewise has not found it possible to demonstrate clinically any direct effect on tonicity. In a number of cases Mackenzie and Cushny could not elicit any change in the area of cardiac dulness, even although the patients' condition had improved satisfactorily under the administration of digitalis.

Schmoll, on the other hand, regards digitalis as having a specific action on tonicity. Loss of tonicity is shown first by general symptoms—râles over the bases of the lungs, enlargement of the liver, and slight œdema of the ankles. Digitalis is indicated whenever these symptoms appear. Schmoll's observations on blood-pressure amplify those of Müller, Mackenzie, Gottlieb, and others, in demonstrating that the tonic use of digitalis does not tend to raise the blood-pressure. On the contrary, a fall in the systolic pressure was often noted coincident with an improvement in the general condition of the patient.

II. *Cases in which the Heart is not responding to Stimuli from the Sino-Auricular Node, but in which there is Auricular Fibrillation with Perpetual Arrhythmia of the Ventricles*. — The administration of digitalis to cases of this group is often followed by a wonderful improvement in the patients' condition. It is true that the normal rhythm is not restored, and that the auricular fibrillation persists; nevertheless Cushny finds that the symptoms of heart failure disappear much more rapidly than in cases with preservation of the normal rhythm. Coincidentally the pulse-rate falls to about the normal, the beats become stronger, and the patient is often able to resume his work if it is not of an exhausting nature. The slowing of the pulse in these cases is due to digitalis lessening the conductivity of the auriculo-ventricular bundle. Wenckebach has shown that pressure upon the vagus in the neck slows the pulse in the same manner as digitalis does, and that in one case in which vagus pressure was ineffective in lessening the pulse-rate, digitalis was also ineffective. The atropin tests recorded by Cushny also support the view that it is mainly, if not solely, in virtue of its inhibitory action that digitalis exerts so beneficial an effect in cases of auricular fibrillation.

When digitalis is pushed in cases of auricular fibrillation the ventricular rate may fall below the normal, and a continuous coupled rhythm of the ventricles may be induced. According to Cushny this form of arrhythmia may be, at least in part, the indirect result of the slow rhythm which allows the irritability of the ventricle time to develop. The arrhythmia is therefore an indirect result of inhibition.

Norris discusses the question as to whether it is desirable to push digitalis so far as to set up a continuous coupled rhythm. He admits that an extra-systole or a continuous coupled rhythm may conceivably be beneficial if the auricle is much more dilated than the ventricle, but he points out that the establishment of such an allorhythmia indicates at how great a cost the heart is accomplishing its task, and that hearts which give this reaction are seriously damaged organs. If an arrhythmia, previously absent, appears under the use of digitalis, we have done harm. The production of a coupled rhythm under digitalis may do temporary good and may be associated with disappearance of dropsy, cyanosis, &c., yet only hastens the ultimate exhaustion of the cardiac reserve power. Norris therefore concludes that the appearance of a coupled rhythm is an immediate signal for the withdrawal of digitalis.

Digitalis does not, of course, invariably act well in cases of auricular fibrillation. Windle finds that in rheumatic cases occurring in young persons the response to digitalis is generally prompt, but when auricular fibrillation occurs in people over middle age and with arterial degeneration, even though they be rheumatic cases, the reaction is uncertain. He suggests that failure of response to digitalis depends not merely upon the extent and degree of degeneration of the heart muscle, but upon the presence of associated renal disease. It is well recognised that digitalis fails to act in toxic conditions of all kinds. Heart disease and Bright's disease are often intimately associated with arterial degeneration, and the absence of response to digitalis is to a great extent a measure of the renal element in the case, and is of value in prognosis, signifying, as a rule, that the condition is terminal.

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SURGERY.

THE TRYPSIN TREATMENT OF SURGICAL TUBERCULOSIS.

BATZNER (*Archiv. f. klin. Chirurg.*, Bd. xev. Heft 1), writing from Bier's clinique in Berlin, gives an interesting description of the results following the use of trypsin injections in cases of surgical tuberculosis.

The theory underlying the treatment was first put forward by Jochmann and his co-workers, who found that the pus of tubercular abscesses consisted of lymphocyte elements containing no proteolytic ferment, and that the breaking up of the albuminous material, its peptonisation and absorption are consequently very slow. They believed, therefore, that the introduction of a digestive enzyme would bring about the changes necessary to promote the absorption of the pus.

In applying the theory practically, Bätzner's first difficulty was to obtain a reliable preparation of trypsin, and after trying various solutions he found that Fairchild's preparation, put up in capsules containing 1 c.cm., was much the most active, gave constant results, and kept for an indefinite length of time. He found that the injection of trypsin into healthy tissues occasionally produced a very slight local reaction, never the least constitutional disturbance. When injected into diseased tissues local and general disturbances of varying degree may follow.

Locally, slight pain and inflammatory reaction with slight general malaise and fever are often produced. Occasionally the local reaction is very marked, resembling the onset of an acute phlegmon in the soft tissues. Severe pain with great swelling and redness, accompanied by a rigor and high fever, may then be caused, but these symptoms disappear spontaneously in a few days. Severe reaction only follows injections through unbroken skin, especially into tuberculous disease in tendon sheaths. Following the reaction favourable changes take place, which may be summarised as follows:—The injection of the ferment produces a healthy hyperemia, with cellular proliferation and infiltration leading to the formation of healthy connective tissue and the death and removal of tuberculous tissue. The pus of abscesses becomes thin and serous in appearance, while the abscess walls come together gradually and adhere, leaving a thickened scar behind. Fistulae heal readily, while ulcers take on a red healthy appearance and heal over quickly.

A very striking feature in almost all the cases treated was the marked improvement in the general health, which appeared, in some cases, before much change in the local condition was evident.

Cultural experiments showed that trypsin has no special action on tubercle bacilli and that its beneficial action is due to its stimulating properties on the tissues.

The treatment is carried out as follows:—Each injection consists of 1 to 2 c.cm. of Fairchild's trypsin solution diluted ten times with normal saline. The number of injections varies indefinitely. Sometimes 2 to 3 suffice, sometimes they must be continued for several months. An interval of 6 to 7 days may be allowed between injections, and in any case all local reaction must have subsided before injections are repeated. Sinuses and fistulae must not only be filled with the solution, but their

enclosing walls must be injected with it. Ulcers may with advantage be powdered with Fairchild's trypsin powder, while injections are also made into the surrounding tissues. Joints are treated by intra- and peri-articular injections.

Pain is caused by injection into the tissues, but is of short duration and never very severe.

Bätzner states that sufficient time has not elapsed to enable him to make very positive statements about the ultimate results in joint tuberculosis, but as far as he has gone his results have been most encouraging. The general indications for the treatment may be stated to be the same as those for iodoform injection, on which the trypsin treatment appears to be a notable advance.

References are given to the opinions of others who have used the method, and illustrations and X-ray photographs of the cases treated accompany the paper.

J. W. STRUTHERS.

ON ATONY OF THE CÆCUM AND RELATED CONDITIONS.

Under the above title Fischler (*Münch. med. Wochenschr.*, No. 23, 1911) discusses the explanation of a group of symptoms which are frequently erroneously attributed to chronic appendicitis and for which the appendix may be removed without relief of the trouble.

The condition is characterised by intermittent pain in the caecal region, sometimes coming on spontaneously, sometimes elicited by palpation; by an air-cushion-like swelling in the same region, in which gurgling and pain are produced by deep pressure; and by irregularity in the movement of the bowels, constipation or diarrhoea, or the one alternating with the other, being present. The condition may be differentiated from appendicitis by the absence of muscular resistance or rigidity, the absence of fever, leucocytosis, increased pulse-rate, and furring of the tongue. The symptoms have been variously attributed to appendicitis, undue mobility of the caecum, torsion with dilatation of the caecum, and dragging on the peritoneal attachments of the caecum when full of faecal material. Fischler believes from his observations that the condition is due primarily to catarrh, associated with an atonic condition of the caecal wall. The importance of recognising the condition lies in the fact that surgical treatment is unsatisfactory. Fixation of the caecum and short circuiting alike give bad results, and the best results follow careful avoidance of food which gives rise to flatulence, avoidance of strong purgatives, massage of the caecal region, the application of hot moist compresses, and occasional courses of bismuth.

J. W. STRUTHERS.

CLINICAL RESULTS FROM THE USE OF SALVARSAN.

The experience of Fox and Trimble (*New York Med. Journ.*, vol. xciii. No. 10) gained in the treatment of fifty cases of syphilis with salvarsan

has convinced the authors that recurrence of the manifestation of the disease after an apparently successful single injection of the drug is more common than their study of the literature of the subject has led them to believe was customary. They mention the result of the postal census of cases conducted by the *Medizinische Klinik*, where it was found that out of 4766 cases that were apparently cured after a single injection only 207 had relapsed. They are confident that when these cases are further investigated a much larger number of relapses will have to be recorded. The authors add their tribute to the volume of evidence in favour of the marvellously curative effect of salvarsan in syphilis. In their opinion relapses occur more frequently after the use of salvarsan than after treatment with mercury.

They would reserve the use of salvarsan for selected cases—those with pronounced lesions of the mucous membranes, malignant precocious syphilis, and cases that are intolerant or refractory to mercury.

They adopt the practice more recently recommended by Ehrlich—intravenous injection followed in four days or later by an intramuscular injection of an oily suspension.

Burke (*New York Med. Journ.*, vol. xciii. No. 10) advocates the injection of salvarsan in a lanolin and oil emulsion, on the grounds of convenience, simplicity, and painlessness. He uses a 10 per cent. lanolin in olive oil emulsion.

The technique of injection is as follows:—The vessel containing the lanolin and oil mixture, a small mortar and pestle, and the hypodermic needle and syringe are sterilised by boiling. Two c.c. of the oil is then placed in the mortar and the salvarsan powder added and stirred into an emulsion. This is drawn into the syringe, with an extra 1 c.c. of the oil added to remove all the drug from the mortar. The emulsion is injected intramuscularly, care being taken not to puncture a vein.

HENRY WADE.

ABERRANT GOITRE.

E. Gellé and P. Bertein record two cases of solid tumours occurring in the thyroglossal tract (*L'Echo méd.*, 5th March 1911). Both were situated at the base of the tongue. The first was the size of a large hazel nut, placed at the apex of the lingual V, and covered with a rich venous network. The first and only symptom was hæmorrhage from one of the veins. The tumour was with difficulty removed through the mouth, as there was no distinct plane of cleavage. It was bi-lobed, one lobe median in position and seeming to emerge from the foramen cæcum, the other to the left and gradually tapering off into the substance of the lingual muscles. Microscopically the lobes were found to differ in structure, one showing the typical appearances of the thyroid gland with patches resembling parenchymatous goitre, and the other consisting almost wholly of a rich network of glandular proliferation with no colloid material.

In the second example the tumour was of larger size, filled up the greater part of the pharynx, and had for some weeks given rise to respiratory embarrassment, which was aggravated by bronchitis. Swallowing was not affected to the same extent. Tracheotomy was performed with immediate benefit, and the tumour was removed at a later date. Chloroform was administered through a Trendelenburg cannula, the pharynx was opened by a median incision splitting the hyoid bone, and after a laborious dissection the tumour was enucleated. In this instance, as in the last, the hæmorrhage during operation was profuse. On the fourth day the cannula was removed, and the patient made a speedy recovery. Microscopically the tumour was found to consist of two parts, one composed of lobules of thyroid tissue with muscle bundles penetrating here and there, and the other of dense connective tissue with some calcareous deposits.

In all, forty-three cases of solid tumours of the thyroglossal tract have been recorded. They occurred almost exclusively in females, and at any age, but usually about puberty. On two occasions they occurred in the new-born and proved rapidly fatal. The first symptom varies. It may be hæmorrhage from the mouth, respiratory embarrassment, myxœdema, or laryngitis. As the growth increases in size it gives rise to difficulty in moving the tongue, in swallowing, and in phonation. The tumour is covered by mucous membrane which is rich in veins, and in its growth it may lead to ulceration and repeated hæmorrhages. The structure of the tumours follows two different types—thyroid tissue left behind during the descent of the gland, and elements which represent a primitive stage in the glandular development. The latter type forms the adenomatous tumour first described by Bochdaleck. The two structures frequently coexist in the one tumour. The thyroid tissue may exhibit the same changes as occur in parenchymatous and cystic goitre. Calcareous degeneration also occurs. In position the growth may be submucous or intramuscular. Its removal may be followed by myxœdema.

JAMES LOCHHEAD.

THE THREAD TEST IN THE DIAGNOSIS OF GASTRIC ULCER.

In 1909 Einhorn introduced his thread test as an aid to the diagnosis of ulcers of the stomach. Morgan (*Med. Record*, p. 381, 4th March 1911) describes the application of the test. At night, preferably on an empty stomach, the patient swallows a small metal bucket attached to a braided silk thread on which is placed a knot 75 cm. from the bucket; the thread is swallowed till the knot is opposite the incisor teeth. In the absence of stenosis the pylorus should be traversed in from 2 to 8 hours. On the following morning the thread is withdrawn and examined. The lower end of the thread should be bile stained, and the bucket may contain some bile and mucus. If the pylorus has not been passed a smaller bucket may be tried on the following day. A red or brownish discoloration

of the thread indicates an ulcerated surface, and the position of the lesion may be estimated by the distance of the blood-stained portion from the teeth.

In cases in which the test is positive a repetition of the experiment usually gives a similar result, and a definite diagnosis of a simple or malignant ulcer of the stomach may be made. The method applies also to duodenal ulcers, but is negative in ulcers of the fundus or greater curvature of the stomach.

Einhorn (*Med. Record*, p. 475, 18th March 1911) records the examination of 36 cases. These include 30 cases of ulcer of the stomach or duodenum, 5 cases of cancer of the stomach, and 1 case of cirrhosis of the liver with gastric bleeding.

In 2 cases subsequently operated on, an ulcer was found at the spot corresponding to the stain on the thread. In 6 cases of ulcer of the stomach with previous hæmorrhage the test proved negative. The hæmatemesis in 2 of these had occurred 12 and 15 years respectively before, and it was concluded that the ulcers had meanwhile healed. In the other 4 cases the ulcers were probably situated on the greater curvature or in the fundus. When the treatment was successful perfect healing was indicated by the test becoming negative.

In several cases of cancer the bucket did not pass beyond the pylorus and came back filled with a brownish fluid of a foetid odour, the thread being also discoloured for some distance above the bucket.

The method has been tested by von Barth-Wehrenalp, who succeeded in obtaining a sample of the duodenal contents in more than half of his cases of duodenal or gastric ulcer, but failed to obtain a positive staining of the thread. This conflicting result is ascribed by Einhorn to faulty technique, as the patient was allowed to swallow some water during the introduction of the bucket, which was removed again in 3 hours. It is important to allow the bucket to remain for 8 or 10 hours to ensure that the pylorus is passed, and to allow time for the thread to be impregnated with blood.

JAMES M. GRAHAM.

OBSTETRICS AND GYNECOLOGY.

By A. H. F. BARBOUR, M.D., LL.D.,

Lecturer on Gynecology, University of Edinburgh :

and

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PUERPERAL ABSCESS OF THE UTERUS.

To judge by the number of cases recorded, intramural abscess of the uterus is not a common condition. Barrows (*Amer. Journ. of Obstet.*,

April 1911), however, records seven cases which have come under his observation, of which six were puerperal in origin and one gonococcal. With other writers on the subject, such as Noble and Sampson, he shares the belief that the condition is really commoner than is supposed. Some of the cases are diagnosed as pyosalpinx or cellulitic abscess, others cure spontaneously by rupture into the uterine cavity, while in a few the pus becomes sterile and the site of a calcareous deposit.

In his six cases the symptoms took the form of severe cramp-like abdominal pain, accompanied by tenderness of the lower abdomen and elevation of pulse and temperature. Rigors were exceptional. The symptoms came on late, usually about the fourth day, and in two cases not till a fortnight after labour. In three of the cases the uterus had been curetted in the puerperium. The physical signs were tenderness over the brim of the pelvis and the presence of a distinct tender swelling on the uterus on bimanual examination. In all six cases the organism present was a streptococcus. All were operated on, five by the abdominal route and one by the vaginal. Free drainage by large rubber tubes was established, and, in addition, three were treated by vaccines. All recovered. Barrows lays emphasis on the importance of not operating too soon in these cases. In all he waited for at least a week, and in some for as long as three weeks, after the development of the symptoms. By that time everything is shut off by adhesions and there is much less risk of setting up a general peritonitis.

SALVARSAN ("606") IN OBSTETRICS.

Lemeland (*L'Obstétrique*, April 1911) gives a careful review of all the literature relating to the use of salvarsan for the treatment of syphilis in pregnant women. He has collected 39 cases, and from the study of these draws the following conclusions:—The intravenous injection of "606" is as well stood by pregnant as by non-pregnant women, whilst its action on the syphilitic lesions is as effective. Its elimination is as rapid and its effects on Wassermann's reaction as pronounced as in the non-pregnant state. There appear to be no toxic effects on the foetus. In one case, however, that of Gluck (*Munch. med. Wochenschr.*, August 1910), fetal movements ceased the day after the injection. In 32 cases of which there are definite records the child was born alive in 30, dead in 2. In no case did the injection lead to abortion. It would thus appear that salvarsan may be safely administered to pregnant women, and its use results in the birth of a larger percentage of living children than obtains in the absence of such treatment.

As regards the use of "606" in infants with congenital syphilis, the results so far are not quite conclusive, and a larger number of cases will require to be recorded before a definite opinion regarding it can be pronounced. There are three ways in which the treatment can be carried out—(1) by direct injection into the infant; (2) by injection into the mother who is nursing the infant; (3) by injecting serum of

a syphilitic treated with "606." Of these the first method has given the best results. The injection may be made intra-muscularly or subcutaneously, the dose used varying from 0.01 to 0.06 grms. In the case of the smaller dose the injection may be repeated in 10 days or so. The definite syphilitic lesions, such as roseola and pemphigus, as a rule rapidly disappear, but the Wassermann reaction remains positive for a much longer time than in the adult, and after a time fresh lesions make their appearance in many cases. It is probably best, therefore, to carry out the ordinary mercury treatment, even if "606" has been used. Its use is not unattended with risk, as out of 66 cases recorded there were 21 deaths—a mortality of 31.8 per cent. All these deaths cannot, of course, be attributed directly to the use of the drug.

The treatment of the infant through the milk of the mother who has had a dose of "606" has not given good results. Out of 18 cases 6 are reported as successful, 12 unsuccessful, and of these 3 died. It has been shown that very little arsenic passes into the milk, and any effect on the infant must be produced in some other way than the direct transference of the drug. Further investigation is needed before definite rules can be laid down for the treatment of congenital syphilis by "606," but there may yet be a wide field for its use in such cases.

CÆSAREAN SECTION FOR PLACENTA PRÆVIA.

Of late years a number of articles have appeared in the German journals by, among others, Krönig and Sellheim advocating the more general employment of Cæsarean section in cases of placenta prævia. They base their conclusions on the apparently better results for mother and child which they have obtained by the major operation as against those obtained by purely obstetrical treatment, such as turning and the use of Champetier de Ribes's bag. Their view of the question is contested by Couvelaire (*Ann. de Gynéc. et d'Obstét.*, April 1911). He gives the statistics of the cases of placenta prævia treated in the Clinique Baudelocque, Paris, for the period 1890 to 1910. During that time there were 162 cases so severe as to call for definite treatment during pregnancy or labour. Minor cases calling for no treatment are excluded. Of these 87 were treated by rupture of the membranes, 62 by rupture of membranes and de Ribes's bag, 7 by bipolar version, 3 by manual dilatation, and 3 by internal version. There was a total maternal mortality of 10, or 6.7 per cent. Krönig, for a similar set of cases treated in the same way, gives a mortality of 20 per cent. If the cases be excluded which on admission were in a dying condition from hæmorrhage or sepsis—the type of case in which Krönig advises against Cæsarean section—the mortality is reduced to 3.2 per cent. and the mortality from hæmorrhage to 1.28 per cent. This is a result which will compare favourably with any similar series of cases treated by Cæsarean section.

The foetal mortality in the cases where de Ribes's bag was used was

66 per cent., but a large number of the children were premature, and in them the mortality was very high. The German operators advise against Cæsarean section if the child is very premature, because there is little chance of saving it. So that as far as the question of infant mortality goes, there is little to choose between the methods, and it is just a question whether the chance of saving the child can be put against the additional risk run by the mother if the abdomen is opened.

Couvelaire admits that there are cases where Cæsarean section should be the operation of choice, as, for instance, in elderly primiparae with rigid cervix and in cases of contracted pelvis. He would also be inclined to include some of the cases in which the German operators advise against the operation, viz., those in which the patient is in a very bloodless condition and delivery cannot be effected without force. In these he would advise the Porro operation. In this connection an interesting case is recorded by Reymond and Cazalis (*Ann. de Gynéc. et d'Obstét.*, April 1911) in which total hysterectomy was performed for placenta prævia, the uterus being removed without opening it, for fear of further hæmorrhage. After removal the uterus was opened and a living child obtained. The time elapsing between the cutting of the second uterine artery and the opening of the uterus was about one minute.

AFTER-RESULTS OF SUPRAVAGINAL HYSTERECTOMY FOR FIBROIDS.

The conservative surgery of the uterus and ovaries has of late years received a great deal of attention. This is the result of recent researches on the functions of these organs and on the general effects following their complete removal. Alban Doran (*Transactions of the Royal Society of Medicine*, 1911, p. 115) makes a further important contribution to the literature of the subject in giving an analysis of the after-histories of 40 patients on whom he performed supravaginal hysterectomy for fibroids with the object of bringing out the results of conserving one or both ovaries and a part of the uterine mucosa. He adds to these 40 cases other 60 which he previously recorded, making a total of 100. In all at least two years had elapsed since the operation, a condition which he lays down as essential in arriving at any conclusions. The inquiry is mainly concerned with the presence or absence of menopausal symptoms following the operation, and, when present, their severity. In the 100 cases, therefore, only those are included who were still menstruating at the time of operation.

It is important for the patient that she should be saved as far as possible the annoying general symptoms of the artificial menopause, such as flushing, sweating, nervous irritability, &c., but apart from these it is also well if the actual menstrual flow can be continued for some time. To this end Doran advocates not only conserving one or

both ovaries, if healthy, but also some of the uterine mucous membrane. This he does by making a high amputation above the level of the os internum, whenever possible. In one case in which both ovaries had been removed menstruation continued for two years after the operation as the result of some uterine mucous membrane being left, and the patient suffered from none of the symptoms of the artificial menopause. In 3 cases the menopause was complete with no symptoms, 4 had mild symptoms, and 4 had severe symptoms. In 13 cases in which one ovary only was removed, complete and immediate cessation of menstruation occurred in only 5. The other 8 cases continued to menstruate for some time, and then gradually ceased, and had no severe general symptoms. In 6 of these the line of amputation was above the os internum. In the other 2 menstruation only lasted a short time, and there was a good deal of vertigo and flushing. In 15 cases both ovaries were left, and in 5, where the line of amputation was above the os internum, menstruation continued regular, and there were no general symptoms. In 2 where the amputation was also above the os internum menstruation soon ceased, and in one slight neurosis developed. In 8 cases the menopause was complete and immediate, although in only 3 was the amputation below the os internum. In the 5 cases where some of the uterine mucosa had been left there were, however, no general symptoms. In the other 3 there were slight flushings, &c., but as a septic element was present in 2 of them, definite conclusions cannot be drawn.

Further considerations, such as the age of the patients, the nature of the previous symptoms, and the character of the tumour, are fully taken up in Doran's tables, but cannot be discussed here. Enough has, however, been shown to establish his contention that in operating on uterine fibroids not only the ovaries but also part of the uterine mucosa should, if possible, be left. In this contention he is strongly supported by other operators of similar large experience, such as Kelly, Cullen, and Zweifel. It would be interesting, as the author suggests, to have a similar analysis of cases from those who advocate and practise total hysterectomy for fibroid tumour.

PATHOLOGY.

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VARIABILITY AMONGST BACTERIA.

THE question of the variability of pathogenic germs is one of fundamental importance in preventive medicine as well as in bacteriology.

Bacteria are, somewhat arbitrarily, divided into groups according to their morphological, staining, or cultural characters. These groups represent more or less what the biologist understands as species. There are often many members belonging to a group with certain characters in common. Some one or more members of the group may be pathogenic in the human subject. Is it possible for some other non-pathogenic forms belonging to the same group or species to acquire the character of pathogenicity? In other words, have we in these non-pathogenic varieties a storehouse from which disease-producing forms may at any time arise? To give some examples: There is a large group of bacilli with many morphological and cultural properties in common to which the name of the typhoid-colon group is given. It often requires the application of a number of tests before it can be decided with what member of the group one is dealing. One member of the group, the bacillus typhosus, is very constantly pathogenic, producing a well-defined disease. Is it possible for other members of the group, for example, *B. coli communis*, under certain conditions, to become pathogenic in the way in which *B. typhosus* is? It is generally assumed that it is not, and on this assumption all our preventive measures in connection with typhoid fever are based.

There is another group of germs of considerable size which includes the organism of diphtheria, and also a large number of what are called diphtheroid bacteria. With the exception of the character of pathogenicity it is often a difficult matter to decide whether one of this group is the true diphtheria bacillus or one of the harmless diphtheroids. These diphtheroids are widely distributed, and often found in the nasal passages and in the accessory sinuses. If it is possible for any of these under certain conditions to become pathogenic in the same way as *B. diphtheria*, then our views upon that disease and its mode of propagation would be fundamentally altered.

Lastly, there is a large group of bacteria which have a staining character, acid-fastness, in common, also certain cultural characters—a group to which the *B. tuberculosis* belongs, but to which also the organism of fish and bird tubercle, *B. smegmatis*, the Timothy-grass bacillus, and other organisms belong. Is it possible for any of these germs to become pathogenic for mammals? If so, our views upon tuberculosis would undergo considerable alteration.

Now this is, of course, fundamentally a problem which is not peculiar to bacteriology. It is one which has for long occupied the attention of biologists. How do new species of animals or plants arise? Is it possible for one species to become transformed into a closely related species? There are two distinct views held regarding this question. The one is that a new species arises by a gradual process of alteration in one direction. One individual differs from another of the same species; the difference may be scarcely percept-

ible, but it is nevertheless there. These variations are some of them favourable to the propagation of the species, others are unfavourable. The favourable variations are seized upon and developed by the process of natural selection, and eventually, after a very long period, the difference in a given strain from other similar strains may be so marked as to warrant the use of the term "new species." Such variations are known as the "fluctuating" type, and the view that these are the chief factors in the formation of new species was held by Darwin, and is still held strongly by Wallace. The other view is that the variations which are of importance in the formation of new species are the suddenly arising marked differences, sports, "discontinuous variations" or "mutations." The view that these are the great factors in the production of new species, and that in this way they may arise suddenly, at one swoop, is held more particularly by de Vries. Undoubtedly what appear to be new species have arisen in this way, but Wallace concludes:—"These facts seem to rule out of court as hopelessly inefficient the modern theories of mutation and Mendelism which depend upon such comparatively rare phenomena as sports and abnormalities, and are, therefore, ludicrously inadequate as substitutes for Darwinian factors in the world-wide and ever-acting processes of the preservation and continuous adaptation of all living things" (*The World of Life*, p. 123, 1911).

As regards the first method of origin, by the accentuation of variations of the fluctuating type, evidence in its favour can be produced, but the period necessary for the process must obviously be a long one. Probably both are factors in the production of new species, but which has played the greatest part in the formation of species in the past is a matter for conjecture.

But to return to bacteria. Slight variations have been observed to arise in organisms under natural conditions, for example, the loss of the pigment-producing character in such organisms as *staphylococcus aureus* and *bacillus prodigiosus*, but by artificially altering the conditions of life of organisms a large number of variations have been produced. Thus Kruse found that *staphylococci* lose their gelatine-liquefying power after prolonged cultivation under anaerobic conditions. Pasteur long ago showed that the anthrax bacillus loses its virulence and its power of producing spores when grown at a temperature of 45° C. Peckham has shown that organisms which have not the power to produce indol may do so if grown in certain media. Andrewes and Horder, Twort, and more recently Glenn, have produced alterations in the sugar-fermenting properties of bacteria. The variations thus produced are, however, as a rule, of a transitory type, the organism tending to revert naturally to its previous condition. Sometimes, as in the case of anthrax, the variation appears to be fairly permanent until the organism is passed through an animal.

It is well to remember when dealing with bacteria that the conditions are not the same as in the higher plants. In the first place, bacteria are probably the lowest and simplest organisms known. They multiply by division, and multiply very rapidly: hence they go through many generations in the course of a single day. It is not unreasonable to suppose, therefore, that the formation of new species may be more rapid than in other higher plants and animals. But there are certain difficulties which obtain when studying the question amongst bacteria. It is a difficult matter to separate a single individual and study its progeny. Further, there is always the possibility of contamination of pure cultures from outside sources.

Let us see what amount of evidence there is on this question, and first of all let us take the colon-typhoid group of germs.

The variations observed have been chiefly in the capacity of the organism to ferment certain sugars. Thus Twort succeeded after two years in inducing a certain strain of *B. typhosus* to ferment lactose. Penfold (*Brit. Med. Journ.*, 1910, vol. ii. p. 1672) has induced another strain to ferment dulcitol and arabinose, and has also developed a strain which does not ferment glycerine. Penfold has also experimented further with Twort's lactose-fermenting typhoid strain, and finds that on plating out on lactose it always gives rise to fermenting and non-fermenting colonies. Subcultures of the fermenting colonies give rise again to fermenting and non-fermenting colonies. There is thus a tendency for the newly-acquired character to disappear.

More recently Horrocks (*Journ. of the R. A. M. C.*, March 1911) has gone further, and has converted three strains of *B. typhosus* into an organism possessing all the characters of *B. faecalis alcaligenes* by growing the organisms in a medium prepared from the urine of a typhoid carrier. This *B. alcaligenes* he was able to modify further into an organism with the characters of *B. coli*, and apparently still further into a Gram-positive coccus. The last-mentioned variations appeared after inoculating animals intra-peritoneally, and there must be more than a suspicion that infection had occurred from the alimentary tract. The author, however, states that the alteration into the coccus was a gradual one, and that the organism readily reverted to the bacillary form.

Another strain (*S. bacillus*), isolated from the urine of a patient who had suffered from typhoid, showed cultural characters intermediate between those of *B. typhosus* and *B. coli*, but it produced in animals agglutinins specific for *B. typhosus*, removed agglutinins from a known typhoid serum, formed opsonins for *B. typhosus*, and produced a serum which deviated complement in the same manner as a known typhoid serum—in short, appeared to be a modified strain of the typhoid organism.

Such experiments go a long way towards showing that variations

among closely allied bacteria do occur. But even so, there remain certain questions to be solved. In the first place, in how far are these variations permanent? We have seen that some are not. Secondly, do they affect the pathogenicity of the organism? The transformation of the non-virulent *B. coli* into the virulent *B. typhosus* is a very different thing from modifying temporarily the sugar-fermenting characters of a related germ so as apparently to produce a new species. On the whole, therefore, there is as yet no proof that typhoid fever can arise in any other way than by infection from a previous case of the disease. In all probability these acquired characters are transitory, the organism readily reverting to the original type.

Another most important group of organisms among which modification has been attempted is the tubercle group. To this group belong the organisms of human, bovine, avian, fish, and reptilian tuberculosis. Some would include in this group *B. smegmatis*, the bacillus of Timothy-grass, and others possessing the so-called "acid-fast" character. This character of acid-fastness, it should be remembered, however, is not a constant one. There is great variation among the organisms already mentioned as regards degree of acid-fastness. According to Betegh (*Centrabbl. f. Bakt. Orig.*, Bd. lviii. H. 6, S. 498) the organism of fish tuberculosis is not acid-fast when stained by Ziehl's method. Again, *B. smegmatis* is acid-fast but not alcohol-fast, as is *B. tuberculosis*.

What evidence is there that any one of these organisms can be transformed into another? Taking, in the first instance, the varieties most closely related, viz. the human and bovine types of the tubercle bacillus, we find opinions widely divergent regarding the possibility of transformation of the one type into the other. In the second Interim Report of the Royal Commission on Tuberculosis mention is made of some experiments which went to show that a human strain could be modified in such a way as to give the biological and cultural characters of the bovine type by passing the organisms through the calf. We have, on the other hand, the statement by Cobbett, who performed these experiments for the Commission (*Journ. of Path. and Bact.*, vol. xiv. p. 563, 1910), that he, personally, always was sceptical of these results, and that on performing the experiments again with greater precautions (*i.e.* keeping the calves strictly isolated from animals infected with the bovine bacillus) the results were entirely negative. Cobbett believes the balance of evidence to be on the side of the stability of these two types.

In support of the position of the Commission we have, however, certain experiments performed by Eber (*Munch. med. Wochenschr.*, No. 3, 1910, S. 115). This author was able to transform a human type of germ into a bovine type by inoculation into the peritoneal cavity of bovines. This has been done by him in three strains out of seven isolated from cases of pulmonary tuberculosis.

A similar view is held by Calmette. He points to the curious fact that whereas from bone, gland, and intestinal lesions in numerous cases bovine strains have been obtained in man, yet from cases of pulmonary tuberculosis only human strains have been separated, and he explains this fact by assuming that either in the lung tissues or during their passage to the lungs the bovine organisms become transformed into germs of the human type. Without doubt the above fact is a most striking one, but there is as yet no evidence that this transformation actually does take place within the human body.

Coming to the types of the tubercle bacillus more widely divergent from the human, we find that in several cases now (Duval, *Sixth Internat. Cong. on Tuberculosis*, Washington, 1908) organisms resembling the avian type of the tubercle bacillus, both as regards their cultural characters and as regards the lesions produced by them, have been isolated from the human subject. This is an example of variability in virulence, the germ retaining its other characters intact.

On the whole, therefore, there seems to be fairly strong evidence that there are strains of the tubercle bacillus capable of variation in virulence and in other characters. Whether there is the wholesale variability assumed by Calmette is quite another thing. The interesting fact which he attempts to explain as above mentioned may be explicable by assuming that cases of bovine infection in the human subject do not develop pulmonary tuberculosis, because they die of meningitis, generalised blood infection, or some other intercurrent disease.

Another group of organisms more or less closely related to one another is the diphtheroid group. Lewis (*Birm. Med. Review*, August 1907) distinguishes five varieties belonging to the group. Special names are given only to two of these, one being *B. diphtheriæ* (Loeffler), the other *B. Hoffmanni*, the rest being usually referred to as diphtheroid bacilli or pseudo-diphtheria bacilli. The various members of the group can be distinguished from one another by morphological, staining, and cultural characters, but in many cases the differences are very slight. The distinguishing character of primary importance is, of course, pathogenicity. Only two members of the group are pathogenic in animals, but only one, viz. *B. diphtheriæ* (Loeffler), produces true diphtheria so far as is known.

What evidence is there of variability in this group of organisms? Goodman has succeeded in modifying the acid-producing capacity of these organisms in special media very much as we have already seen has been done with the members of the typhoid-colon group. What is of more importance is that Ohlmacher has succeeded in transforming short forms of the *B. diphtheriæ* into long forms by passage through a guinea-pig, and long forms into short forms by passage through a white rat. Further, it is a matter of common experience to find that in the course of a single case of diphtheria the type of organism may

alter, in most cases the organism becoming shorter, less granular, and approximating more or less closely to the Hoffmann type. So close is this connection between *B. diphtheriae* and *B. Hoffmanni* that some authorities regard the presence of the latter as distinctly suspicious of the existence of true diphtheria. It may be said, however, that there is no definite proof of the actual transmutation of Loeffler bacilli into Hoffmann bacilli or of the reverse process. One great difficulty in deciding this matter is, of course, the impossibility of testing pathogenicity in the human subject, but a point strongly supporting the specificity of the *B. diphtheriae* is that no substance capable of neutralising diphtheria antitoxin is present in filtrates of cultures of the other members of the group, and diphtheria antitoxin does not protect against the action of the pathogenic organisms other than the true *B. diphtheriae*. Diphtheria bacilli are probably capable of losing their virulence, but there is no evidence as yet that any non-diphtheria-producing member of the group can acquire that character.

One might deal with other groups of organisms in the same way, such as, for example, the spirochaetes, but space precludes. In summing up the evidence one may say that there is little indication of variability in germs in respect of their disease-producing characters. Variations undoubtedly occur, but these are slight, and, in the majority of instances, fleeting. As a matter of fact, this is the conclusion that one might have arrived at *a priori*. If one studies the history of diseases one finds that, in the majority of instances, there is a wonderful persistence of type. Bubonic plague is apparently precisely the same disease as in the time of the ancient Israelites. The descriptions of tuberculous pulmonary disease by Hippocrates and Celsus show that that disease has altered little, if at all, in 2500 years. Diphtheria is described with sufficient accuracy in the Talmud for us to recognise it as the same disease then as now. Then again, no case of specific organismal disease has yet been proved to arise of itself without the possibility of infection from some previous case. History and experience thus support the view of permanence of type in pathogenic bacteria. It is curious that it should be so. Disease germs are the simplest of living things. They pass through many generations in the course of a single day. They are subjected to varying environmental conditions. They often differ only in the minutest respect from allied non-pathogenic forms. Yet in spite of it all they appear to show quite a remarkable permanence of type. This conclusion is certainly comforting. As previously mentioned, all our preventive measures are based upon such an assumption. Further, we apparently need not fear the sudden appearance of new bacterial diseases. This, however, is a statement which must be made with reserve. Theobald Smith considers that bacteria of great pathogenic power should be looked upon as incompletely adapted parasites that have not yet succeeded in

establishing equilibrium between themselves and their host. The less complete the adaptation the more virulent the disease produced. According to this view, *B. coli* may be a more completely adapted *B. typhosus*, and may under certain conditions revert to its pathogenic prototype. Experience is, however, again against the sudden appearance of new pathogenic types. Even influenza can be traced back to the beginning of last century. There is no specific bacterial disease, so far as is known, which has appeared within the last thirty or forty years.

MEDICAL JURISPRUDENCE.

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MENTAL DISTURBANCES FOLLOWING TRAUMATISM.

THE relation of traumatism to mental disturbances is a difficult problem from a legal standpoint. The physician is occasionally asked to determine whether an accident may be followed some time later (weeks or months) by morbid mental manifestations, and whether the latter can legitimately be connected with the former. On the other hand, when mental disturbances make their appearance immediately or very shortly after a trauma, it is important to determine to what extent the traumatic shock is a causative factor in the etiology of the disorder, or whether it merely plays the part of a revealing agent, acting on a brain endowed with a latent morbidity. Gordon (*Med. Record*, 31st December 1910, p. 1179) has analysed a number of cases of this sort, carefully excluding the traumatic neuroses, and comes to the following conclusions regarding them :—

Trauma may be a determining cause of abnormal psychic manifestations, especially head injuries, but not necessarily of a gross character. The symptoms may follow immediately or some time after the trauma, and the most important element in the medico-legal arguments of cause and effect between the psychosis and traumatism is the presence of cerebral symptoms at the time of the accident, and *their persistence*, even in the mildest form, during the interval between the traumatic shock and the confirmed insanity. When the symptoms only become apparent weeks after the shock there is a suspicion that in a mild form they existed immediately after the accident. Extreme precaution must be exercised in regard to the possible existence of unrecognised mental disturbances prior to the trauma, as trauma may act as a powerful stimulus to further development or accentuation of a pre-existing psychosis.

The commonest forms of insanity that follow on and are caused by traumatism are confusional states and delirium, but there is nothing especially characteristic that will differentiate them from similar states caused by other factors, such as intoxications and infections. Delusions and hallucinations may accompany the psychosis, but again with no special characteristics. These mental disturbances are only likely to develop in predisposed neurotic individuals; the majority ultimately recover, but death or dementia may be the final result of persistent confusional and delirious states. Manic-depressive insanity, dementia præcox, and senile dementia are not caused by trauma, nor does general paralysis develop as the result of trauma, but it is important to note that the latter may hasten the development of the disease, and that the development may be exceedingly rapid. Only very close questioning of relatives and friends may reveal the pre-existing mild mental and physical disturbances.

ANAPHYLAXIS AS A DETERMINANT FOR THE SPECIFICITY OF BLOOD.

Various biological tests have been employed for identifying the specific origin of a particular blood, such as the precipitin reaction (Uhlenhuth, Wassermann, &c.), deviation of complement method (Bordet and Genjou, and others), &c. Anaphylaxis was first proposed as a test by Anderson, Besredka, and Rosenau, but at the Brussels International Congress on Legal Medicine in August 1910 it was considered that its value was not sufficiently established. Minet and Leclercq (*L'Echo méd. du Nord*, April 2 and 30, 1911, also *Ann. d'hyg. et de méd. lég.*, April 1911) have investigated further the value of anaphylactic reactions as a medico-legal test for the specificity of blood, and put this method on a par with the precipitin test as regards the degree of specificity, but superior to it because of the easy technique, the minute quantity of blood which suffices for the reaction, and the fact that old or heated blood or turbid solutions of blood serve equally well for the purpose. Guinea-pigs are by far the most suitable animals to employ. To sensitise them intra-cardiac injections are recommended because of the ease with which they can be made, the small amount of sensitising foreign protein required (about 1 c.c. of a 1 in 50 solution of blood in normal saline being the optimum), and the readiness with which accidents of technique can be excluded by autopsy after the subsequent toxic injection. With a small dose such as they recommend, the incubation period during which the anaphylactic state is being constituted is short—12 to 18 days—but once developed it lasts for months. The second or toxic dose should be inversely proportionate in amount to the first or sensitising dose. When the second protein is from the same foreign species as the first, anaphylactic symptoms follow in varying degree—(1) fulminant: immediately after the injection the animal becomes

restless, throws itself about, the abdomen distends and becomes tender, respirations are very rapid, there is salivation, defæcation, and urination, the heart beats feebly, the rectal temperature falls considerably, convulsions ensue, and death occurs in a few minutes; (2) a severe form: characterised by dyspnoea, vertigo, gyratory movements, salivary and lachrymal secretion, a condition of hebetude lasting about an hour, during which time the temperature remains subnormal; (3) a mild form: with prurigo, urticaria, irregular movements, &c., lasting 15 to 30 minutes. Only the fatal and severe forms can be considered diagnostic for medico-legal purposes. Regarding the specificity of the reaction, all that need be stated here is that a guinea-pig sensitised with human serum will give an anaphylactic reaction only with human serum or serum from one of the higher apes (Yamapouchi), not with any of the lower monkeys or other species of animal. Blood which has been heated or even boiled, or which has been exposed to the influence of chemicals such as soap, ink, ammonia, formalin, &c., is still capable of being used as a sensitiser; freezing, desiccation, and age also do not seem to be any bar to its employment. The optimum toxic dose appears to be about 1 c.c. of undiluted blood. It will be observed that it is recommended to employ the unknown blood as the sensitiser; the ideal method would no doubt be to keep in stock a large number of guinea-pigs sensitised by means of comparatively large quantities of blood from man and from various animals, and then to test them by means of small injections of the unknown blood—if it were human then only those guinea-pigs sensitised with human blood would react. But, unfortunately, such a method presupposes that the blood to be tested is fresh and unmodified by heat or other agents, because, although old or altered blood will sensitise, it will not serve for the second toxic or liberating injection. Such a method, therefore, loses much of its medico-legal value. It is, of course, necessary in all cases to be certain that the second doses are not in themselves toxic. If they appear to produce anaphylactic symptoms the reaction must be controlled by testing them on normal unsensitised guinea-pigs, which should not suffer in any way. It is also important to note that to arrive at a positive conclusion only severe anaphylactic phenomena should be accepted as proof, and that several animals should react in the same manner, and lastly, that autopsy should demonstrate that the symptoms are not due to any such accident as intra-pericardial hæmorrhage. To facilitate the solution of the blood for sensitising it should be dissolved in normal saline rendered slightly alkaline with soda, since the globulins, which probably play the chief part in bringing about the anaphylactic state, dissolve more easily in an alkaline medium.

Bachrach (*Vierteljahrsschrift f. gericht. Med.*, October 1910, p. 235) also considers anaphylaxis more sensitive than the other tests for specificity,

although he is of opinion that its medico-legal value cannot yet be definitely ascertained. He recommends subcutaneous injection of guinea-pigs with 1 to 5 c.c. of a saline extract of a concentration about 1 in 1000. Reinjection is made after 3 to 4 weeks, using blood serum which has been inactivated by heating for one hour at 56 to 60 C. : it should be injected at a temperature of 37 C. into the jugular vein. The dose employed should be not more than half of what is just sub-toxic to normal control animals (usually about 0.4 to 0.5 c.c.). At least ten animals should receive the primary injection. Only death or severe symptoms are considered as proof. He has not employed the lowering of temperature as a sign of anaphylaxis.

NEW METHOD OF COPYING FINGER-MARKS.

The older methods of copying finger imprints on glass, wood, &c., for identification purposes consisted in pressing damp blotting-paper or waxed paper on the impression. The former was very unsatisfactory, the latter an improvement, but still not good, because the powder used for dusting over the imprint to render it more visible did not stick well on the waxed surface. Stockis (*Rev. de droit pénal et de criminalogie*, November 1910) has obtained very satisfactory results by the use of gelatine spread in a thin layer on paper, as is done for photographic purposes. Ordinary bromide paper is fixed, well washed, and dried ; in this condition it will keep indefinitely if preserved from damp, Before using it is soaked for a few minutes in water, dried between blotting-paper, and then carefully spread over the surface to be copied. By this means a faithful impression of the original is obtained, and often a second or even a third impression can be taken. If one wishes the imprint on a black background instead of on a white one the paper is simply exposed to light before fixing. Invisible papillary imprints are first made visible by sprinkling over with finely powdered scharlach, calomel, or black oxide of copper, the choice of powder depending on the colour in which it is desired to have the impression. The durability of the preparations is increased by treating the still moist gelatine with formaldehyde vapour. Gelatine paper may also be used for copying ink or pencil writing without in any way injuring the original.

ANTE-MORTEM AND POST-MORTEM BURNS.

The presence of blisters containing serum is generally regarded as indicative of ante-mortem burning, although it has long been recognised that post-mortem burning on oedematous bodies also gives rise to blisters containing serous fluid. K. von Sury (*Leztliche Sachverständigen-Zeitung*, 1910, No. 22), however, is of opinion from observation of burnt bodies, and from experiment, that the blisters formed by the action of flames on dead bodies do not always contain simply gas. He and

Chambert have obtained blisters containing fluid under non-~~o~~edematous conditions. The proof of the intra-vitam origin of the blisters lies not simply in the presence of fluid but in the presence of fibrin and leucocytes in the fluid. The post-mortem blisters appear to be purely mechanical in their origin; there is no evidence that they owe their formation to irritation of still living skin. They do not form in the superficial layers of the epidermis but in the deeper parts of the rete Malphigii or between the epidermis and the corium.

THE PARATHYROIDS AND SUDDEN DEATH IN CHILDREN.

Grosser and Betke (*Münch. med. Wochenschr.*, 1910, No. 40) in an interesting paper record three cases of sudden death in children, in which they believe lesions of the parathyroids to have been the cause of death. These little bodies, of which there are usually four in number, lie in close relationship to the thyroid gland, but are functionally independent of it. They are essential to life, but exactly how much functioning parathyroid tissue is necessary is uncertain, although the available evidence goes to show that more than one must be active for health to be maintained. Extirpation of the parathyroids, both in the human subject and in animals, causes severe tetany, usually fatal, and the younger the subject the more sensitive they are to removal of the glands. Of their three cases, the first was a nine-weeks-old seven-month twin, feeble, but without any apparent illness; it was found dead in its crib five minutes after it had been seen quite lively. The autopsy showed the child to be rickety and to have slight status lymphaticus; the parathyroids were of double the normal size and contained numerous punctiform hæmorrhages, two of the glands being blue-black in colour. Case two was not one of pure sudden death, as bronchitis was present before death. It was a three-months-old child, not lymphatic, the bronchitis was only slight, and as death occurred in an asphyxiated condition with severe convulsions it could hardly be attributed to the bronchitis. Only three parathyroids were found; one on each side was completely hæmorrhagic, the third seemed to be healthy. The third case was one of sudden death with convulsions in a three-months-old infant, and the only lesion found was in the parathyroids, all four of which were completely hæmorrhagic. In none of the cases did the hæmorrhage seem to be secondary to the convulsions; they were older, and, besides, there were no hæmorrhages in the neighbouring thyroid and thymus. It does not seem probable that the hæmorrhages of asphyxia would specially pick out the parathyroids, especially as their tissue is more dense and resistant than that of either the thyroid or the thymus. Although unable to explain why the hæmorrhages occurred, the authors consider that they are not stretching facts too much in attributing the deaths to the destruction of the parathyroid tissue, and

recommend the examination of the parathyroids in any case of sudden death which is not otherwise satisfactorily explained. It is interesting to note that the twin of the first case and also another two-and-a-half-months-old brother died suddenly—cause unknown.

PHYSIOLOGY.

By T. H. MILROY, M.D., F.R.S.E.,

Professor of Physiology, Queen's University, Belfast.

BIOLOGICAL TEST FOR THYROID SUBSTANCE.

PAUL TRENDELENBURG (*Biochemische Zeitschrift*, Bd. xxix. S. 396), continuing Reid Hunt's work on the aceto-nitril test for the recognition of small quantities of thyroid substance, investigated the effects produced by injection of aceto-nitril into animals previously treated with the blood of thyroidectomised animals. Briefly, Reid Hunt's reaction depends upon the fact that white mice fed with thyroid substance are more resistant to the poisonous action of aceto-nitril than normal white mice not so fed. This seems to be due to the fact that in the former there is a greater difficulty in the splitting off of the CH_3 group, and so the hydrocyanic acid component is more slowly set free. This is judged to be the case because thyroid-fed animals are not more resistant to free HCN than normal ones. The protection against aceto-nitril begins within a few days of the commencement with thyroid feeding, and lasts for more than two weeks. The protection can reach a high standard; thus a mouse fed for a period of eleven days with a total quantity of 20 mgrms. dried thyroid substance is resistant to twenty times the lethal dose. The degree of the protection is apparently proportional to the amount of iodine in the preparation, but it is necessary to point out that even the iodine-free thyroid substance exerts a quite distinct influence. As the author holds the view that the function of the thyroid is the neutralisation of poisonous substances which form in the tissues of the body, and are carried to the thyroid by the blood, &c., he thought that these toxic products might be the substances which raised the resisting power of the animal towards aceto-nitril. The thyroid normally would contain these in a concentrated form, while the blood of the normal animal would be comparatively free from them. On the other hand, the blood of a thyroidectomised animal might be rich in these substances. Trendelenburg thought that it might be possible to demonstrate the presence of these non-iodised toxic products in the blood of thyroidectomised animals. The method of experimentation and the results were as follows:—The mice were fed for some weeks before, and also during the experiment, with oats and water. The animals were first tested to discover the minimal lethal dose of

aceto-nitril. This was dissolved in fresh distilled water and injected under the skin of the back. Blood was taken from thyroidectomised cats during the period when the symptoms of thyroidectomy were best marked. The animals during this stage were lethargic, somnolent—allowing, for example, a mouse to pass over the face without making any attempt to seize it. The blood was dried in a vacuum desiccator, powdered, and made up into pills with syrup. These were given to the mice in the morning. In the control experiments, which were always carried out first of all, it was found that when 18 mgrms. (over a period of nine days) of Knoll's thyraden powder were given, the mice withstood a dose of 2.9 mgrms. aceto-nitril per gramme body-weight, while all the control animals not so fed with thyroid substance died after any dose larger than 0.57 mgrms. per gramme body-weight. The protection, therefore, was sufficient to counteract five times the lethal dose. Strange to say, Bayer's iodothylin exercised no protective influence.

Before giving the blood of thyroidectomised animals it was necessary to give the blood of normal animals. It was found that in no case after feeding with the blood of normal animals was there an increase in the resisting power towards aceto-nitril, but in Reid Hunt's experiments rather a slight diminution. On testing the effects produced by feeding with the dried blood of thyroidectomised animals it was found that the mice so treated withstood about double the lethal dose of aceto-nitril.

Trendelenburg therefore concluded that in the blood of thyroidectomised animals there are substances present which give the same biological test as the thyroid gland itself, and as the blood of patients suffering from exophthalmic goitre. It is still, however, a matter of doubt as to the nature of these bodies which are present in the blood of thyroidectomised animals as well as in the thyroid itself.

METABOLIC CHANGES IN THE AQUEOUS HUMOUR.

Knappe (*Skandinav. Arch. f. Physiologie*, Bd. xxiv, S. 259) gives in an interesting communication the results of a prolonged investigation on the above subject. These results may be shortly summarised as follows:—

1. The salt concentration of the aqueous humour is not altered either by atropin mydriasis or eserine myosis; that is to say, salt and water are secreted in the same proportion after atropin and eserine as in the normal eye. A higher saline concentration in the blood-serum is accompanied by a higher saline concentration in the aqueous humour. The osmotic pressure of the ocular fluids is higher than the blood-serum of the same animal.

2. The total protein metabolism in the aqueous humour is not influenced by atropin, but is increased in eserine myosis.

3. The viscosity of the aqueous humour is normal after atropin, increased after eserin, and the increase is due to an increased protein content.

4. Atropin mydriasis exercises no influence on the passage of typhoid agglutinins, hæmagglutinins, and hæmolytic amboceptors from the serum into the aqueous humour, while the passage of these is greatly facilitated in eserin myosis, sometimes rising to ten times the amount present in the control eye.

5. No fibrin is formed in the normal aqueous humour, while in eserin myosis the aqueous humour often clots, but never after atropin.

6. Atropin mydriasis retards, while eserin myosis hastens, the passage of fluorescein from the blood into the anterior chamber.

7. Intra-ocular pressure is not influenced by atropin or eserin.

8. Atropin dilates the vessels of the conjunctiva and of the iris, while eserin contracts the former and dilates the latter. The retinal vessels are not appreciably affected.

9. The aqueous humour is produced by the iris, and also, although to a lesser extent, by the ciliary body.

The various alterations which these drugs give rise to in the production and composition of the aqueous humour depend upon the influence which they exert upon the vital activity of the endothelial cells of the blood-vessels.

BLOOD CHANGES AT HIGH ALTITUDES.

In an interesting communication by Morawitz (*Deutsch. med. Wochenschr.*, 1910, No. 8) attention is specially directed to a physiological method of distinguishing between newly-formed and normal red cells. If the blood of a normal rabbit be kept at body temperature in an aseptic condition and excluded from air, the oxygen content only diminishes very slowly, while if the blood from animals which have been experimentally rendered anæmic by withdrawal of blood at intervals be kept under exactly the same conditions, the oxygen is rapidly used up—in fact, may disappear within a quarter to half an hour. Carbonic acid has then taken its place. The author concludes that the normal red cells show a minimal gas exchange, while the newly-formed red cells, which circulate in large quantities in the blood after anæmia due to hæmorrhage, have a very active gaseous exchange. He believes, therefore, that this method may be employed to recognise regenerative changes taking place in the blood.

The author and a colleague ascended the Col d'Olen (3000 metres) to Mosso's laboratory and estimated there daily the number of the blood cells, their hæmoglobin content, and their oxygen consumption. They noticed the usual increase of erythrocytes, although this was not

so marked as that observed by other investigators. They found that the oxygen consumption of the blood taken at this altitude was never greater than at sea level. The experiments were carried out for a period of eight days. The author concludes that the increase in erythrocytes, which is immediately observed on arrival at a high altitude, and which rapidly disappears, is due to an altered distribution of the cells in the vascular system, and not to regenerative changes in the blood. He therefore agrees with Zuntz's explanation of the phenomenon.

MUSCULAR WORK.

Palmén (*Skandinav. Arch. f. Physiologie*, Bd. xxiv. S. 168) took a long series of ergograms before and after practice and found that not only does the total output of work increase with practice, but also the capacity for prolonged work. An increase in the volume of the muscles and also of the tendons occurs after training, along with changes in the nervous system. Moderate tobacco smoking facilitates at first the output of work, but rapidly this diminishes, and the diminution is most marked in cases where the musculature has been previously fatigued.

The total amount of work for a given height of lift diminishes proportionately with the increase in the weight lifted, and the same holds good in experiments with a constant amount of work per second when the height of the lift is correspondingly varied. The total work for any given weight increases as the intervals between the acts are increased; that is to say, the smaller the amount of work per second. For the performance of equal amounts of work per hour with different weights, the intervals between the lifts must increase as the weight increases. The most favourable resting pause (five seconds in the case of the author) between the working periods corresponds with the quickest rate at which the work for a given weight can be carried out which produces no sign of fatigue.

The author draws certain theoretical conclusions from his investigations. There are two factors which play a part in so-called muscular fatigue, the true "muscular" fatigue, which is the more prominent when large weights are lifted, and the other a "toxic" fatigue of the central nervous system, which is more evident with smaller loads and a more rapid working rate.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL NOTES AND NEWS.

Royal Honours.

OF the six knighthoods bestowed by the King during his visit to Edinburgh two fell to the medical profession, and all old Edinburgh men will join in the congratulations to Sir Thomas Clouston and Sir James Affleck, and wish them long life and health to enjoy the honour so worthily won.

Colonel Warburton.

ON the occasion of their leaving Edinburgh Colonel and Mrs. Warburton were entertained to dinner by the Honorary Staff of the Infirmary and a number of other friends in the Caledonian Station Hotel on 14th July. Principal Sir William Turner occupied the chair, and proposed the only toast of the evening—the health of the guests—to which the Colonel cordially replied. As a memento of the occasion Mrs. Warburton was presented with an album containing the autographs of those present. This gathering formed a fitting close to Colonel Warburton's official connection with the Royal Infirmary, and reflected the cordial relationship which has always existed between him and the members of the Honorary Staff.

The Board of Management of the Infirmary also marked the occasion of the Colonel's retiral by presenting him with a silver bowl at their last meeting.

Graduation Day.

THE number of those who graduated on 28th July is worthy of attention. It is true that under new regulations a considerable number of students complete their course in December, but the July graduation still remains the principal medical one. The pessimists will bewail the fact that only ninety-two qualified for the Medical Register, while the optimists will note that those proceeding to the higher qualifications numbered no less than seventy, sixty-eight taking the M.D. and two the M.Ch. Further, of that seventy, five (one a Resident) were awarded gold medals for their theses, thirteen were highly commended, and nineteen more received the star of commendation. No bad record, and surely evidence that Edinburgh graduates all over the world are keeping up their work.

The Cameron Prize for the most useful contribution to practical therapeutics during the previous five years was awarded to Dr. Simon Flexner, of New York, for his work on cerebro-spinal meningitis, and especially for his preparation of an antidotal serum. Dr. Flexner is the first American to have his name placed on the roll of honour of holders of the Cameron Prize. It is expected that next session Dr. Flexner will visit Edinburgh, and give an address descriptive of his researches.

Professor James Walker delivered the address to the graduates, and discussed the difficulties in connection with the teaching of chemistry to medical students. One of these depends on the fact that the students of medicine no longer form the majority of the students in the chemistry class, and he suggested that the knot of that difficulty might be cut by the appointment of a teacher of chemistry for medical students only, a plan, by the way, which has already been adopted in connection with physics. He would have this teacher—why not professor?—deal not only with the elementary chemistry of the first year, but with the chemistry of all the succeeding years, that concerned in physiology, pathology, toxicology, and in clinical work. Therefore—and here, in our opinion, the chief difficulty arises—he must not only be a medical man, but he must keep himself abreast of all the work being done in each of those branches. Professor Walker says that with the best intentions to adapt the course in chemistry to the wants of medical students he and his assistants are hampered by their lack of knowledge of these (medically) more advanced subjects, and under existing circumstances have no leisure to get them up. We confess we are no great believers in the giving of a medical bias to the teaching of elementary chemistry, and are content that the first professional examination should be of such a nature that the work for it might be done, as it is for certain of the licensing bodies, in any approved institution—university, technical college, or secondary school: but with the rest of Professor Walker's suggestion we find ourselves heartily in accord. We have often referred to the deplorable lack of co-ordination between the work of different chairs, and we hope Professor Walker will weary the Faculty with advocacy of his suggestion that the chemistry of all these different subjects which he mentioned should be taught by one teacher and his assistants. That teacher would at least know how much the students had been taught and how much he was entitled to expect from them, and the adoption of the plan would do something to break up that water-tight compartment system which is far too prevalent in our Scottish universities.

In his peroration Professor Walker referred to two ways of attracting students to a university. "Either make the course of study obviously better (which will generally also mean more difficult) than

in other universities, or else make it obviously easier. . . . Students will be attracted in either case, but not the same class of student in both." Of course we agree, but we think stress should be laid on the fact that it is not severity of examination, but excellence of teaching and of the method of teaching which should be the aim of a university. That is what attracts good students.

**The National Insurance
Bill.**

THE situation with regard to the points at issue between the medical profession and the promoters of the Insurance Bill has not undergone any material change since we wrote last month. Such progress as has been made has been in the direction of meeting the requirements of the profession. The proposal to establish a class of "voluntary" beneficiaries under the Bill has virtually been dropped, but the proposition was from the first recognised to be so palpably unjust and indefensible that there was a suspicion in the minds of many that it was introduced merely that it might be withdrawn. The effect of this concession therefore was discounted in advance, and it has done little to smooth the passage of the Bill. Various amendments have been put down on behalf of the Government which meet to some extent the desires of the doctors, but on the points on which the profession lay most stress, the wage limit of £2 a week, and the control of the doctors by the approved societies, the Government do not see their way to compromise.

There is, we are glad to observe, no sign that the medical profession is inclined to withdraw from any of the demands it has consistently and unanimously made since the Bill was first introduced. Further consideration of the proposals of the Government and closer inquiry into the effects of these on the work and emoluments of medical men have strengthened the conviction that if the Bill becomes law it will revolutionise the practice of medicine in this country, and that the status of the profession will be lowered to such a degree that it will cease to attract men of the class from which it has hitherto been recruited.

As an earnest of its good faith the profession has already raised a substantial guarantee fund to be devoted to contesting the Bill and to providing compensation for members who suffer loss under its provisions should it pass in its present form. This movement deserves the generous support of the profession, and we earnestly commend it.

As we write the subject is receiving the serious consideration of the Representatives of the British Medical Association who on this matter command the allegiance of the profession, and who have already done yeoman service. Their decisions are not yet before us, but we sincerely trust that they will adhere to the position they have already taken up, and will be no parties to bartering and bargaining.

In a memorandum submitted to every member of Parliament by the

Royal College of Surgeons of Edinburgh the necessity for delay in proceeding with the Bill is emphasised. "Time has but strengthened the belief that this delay is not merely advisable but absolutely essential if grave injustice is not to be done to our profession as well as to those of the public for whose special benefit the Bill is designed." If such delay was afforded the College believes that "a better scheme might easily be evolved in consultation with the medical profession—a scheme which would meet the reasonable views of that profession, while providing a real and satisfactory public service for those who genuinely require it." . . . "It is therefore desirable that if the Bill as a whole cannot be delayed *the Medical Benefit part should be withdrawn*. A well matured scheme would then be produced next session after consultation with the profession which has the widest knowledge of the conditions of life among the poor during sickness."

In this proposal it seems to us there is a solution of the immediate difficulties, and one for which every member of the profession should use his influence with his representative in Parliament.

The Highland Doctors. In all the criticism which has been showered on the National Insurance Bill we have not observed any dealing with the exceptional position of the medical men in the Highlands and Islands of Scotland. It may be that those who are familiar with the conditions of practice in these remote districts recognise that no feasible amendments of the proposed Act would really touch their question. There are districts where no capitation grant which even in his most conciliatory mood the Chancellor could agree to would keep body and soul together, and the smallest wage limit which has been suggested would have no terrors for the ordinary crofter. He has no employer, and his employees are his own family. The whole contribution, then, would fall directly on him, and he has no sevenpences to spare. If there was ever a case for exceptional treatment the Highlands provide it. The districts are enormous, the population thin and very poor, and means of communication are few. The present conditions are terribly hard on those members of our profession, who do their best under great difficulties, and they are needlessly aggravated by the helpless relation of the medical men to the parish councils.

It is really astonishing that no steps are taken to give to these men the simple safeguard that every parish doctor in England has in an appeal to the Local Government Board. None of us wants to interfere with a parish which wishes to get rid of an *undesirable*, but the Board should stand between the doctor and the results of petty local squabbles, of which the doctor is often only the shuttlecock.

When conditions are exceptional, remedies must be exceptional too, and what these districts require is something on the lines of the Irish Dispensary system. We would not copy it as it is, but in framing

a scheme for the Highlands we might take the good and avoid the evils of the Irish system. The Highlands are due at least some share of the millions required to finance this scheme, and we hope full consideration will be given to their exceptional circumstances.

The Tuberculosis
Commission.

THE publication of the "Final Report of the Tuberculosis Commission" marks an epoch in investigation relating to the subject. The high

standing of the Commissioners made it certain that their conclusions would carry great weight, and the thoroughness of their ten years' work is evidenced by the fact that the record of it fills twelve considerable volumes. Our readers are probably already familiar with the Commissioners' answers to the questions put to them. Briefly these are—*Firstly*, in man two types of tubercle bacilli occur, the human, to which ordinary cases of pulmonary consumption are chiefly due, and the bovine, which has alone been found in tuberculous cattle, and which occurs in a large proportion of mesenteric tuberculosis and cervical adenitis in children. *Secondly*, while many of the lower animals are insusceptible to the human strain, the bovine type is much more generally pathogenic, and it is specially significant that the chimpanzee is equally susceptible to both types; the Commissioners therefore conclude that mammals and man can be reciprocally infected, and as in many fatal human cases the bovine type is alone present, the possibility of infection from cattle cannot be denied. *Thirdly*, as the ingestion of single small doses of bacilli can originate tuberculosis in animals (observations on the ape being here again specially significant), a considerable amount of the disease in children is to be ascribed to tuberculous milk.

The impartiality of the Commission in reaching their conclusions is evidenced by the pains taken to investigate experimentally the sources of fallacy and by the rigorously critical attitude assumed towards the facts observed. It has been necessary to follow many lines of inquiry. Thus the third great type of bacillus, the avian, has been investigated, though this is unimportant from the human standpoint, and only plays a subsidiary part in spontaneous tuberculosis of the lower animals. Most interest attaches, perhaps, to the study of strains differing slightly from the three types, the most important being those isolated from lupus, which sometimes resemble the human, sometimes the bovine form. In considering the relations of these to the main types, the Commission find that by repeated inoculation into certain animals they tend to assume type characters. With regard to the question of whether the three main types are themselves transmutable, the one into the other, no evidence was forthcoming that this was possible, a conclusion which is of manifest importance in tracing the source of infection in any particular case. Of great significance also is the work which points to the possibility of bacilli

remaining latent and multiplying in the body of a relatively insusceptible animal without producing lesions.

The facts accumulated, falling in line as they do with the results of other observers, support the practical conclusion of the Commission that there must be no relaxation of the regulations as to milk inspection. It is clear that this must be national and not local in its application. Experience shows that rigorous local measures merely result in tuberculous milk being distributed to other centres where inspection is less efficient. It is only by the periodic examination of milk as it leaves the dairy that the evil is to be combated at its source.

While much has been done by the Commission, much remains to do. More information is required as to the proportions of the different strains of bacilli responsible for the different types of tubercular infection in man, and much light might be thrown on the pathology of tuberculosis in man by experiments on the higher apes. If any advance is to be made, however, ample financial resources must be at hand. It is stated that the cost of the present Commission does not fall far short of £75,000, and at this no surprise will be felt. For future developments a Mæcenas is urgently required.

Appointments.

DR. GULLAND, the senior of the assistant physicians, has been appointed Physician to the Royal Infirmary in room of the late Dr. Bruce, and Dr. W. T. Ritchie has been chosen to fill the vacancy on the assistant staff.

**The Dr. Jessie Macgregor
Prize in Medical
Science.**

THE first award of the Dr. Jessie Macgregor Memorial Prize has just been made, the recipient being Agnes Ellen Porter, M.D.(Edin.). The prize has been awarded to Dr. Porter for work done in the last three years, mainly in the departments of bacteriology and physiology, and especially for her work on the precipitin reaction in tuberculosis.

The prize, which is in memory of the late Jessie Maclaren Macgregor, M.D.(Edin.), is to be awarded triennially for original work done in any branch of medical science during the three years preceding the award, and is of the value of £50. The award is in the hands of a body of trustees, consisting of the Dean of the Faculty of Medicine of Edinburgh University, the President of the Royal College of Physicians, Edinburgh, the Treasurer of the Royal College of Physicians, Edinburgh (to whom application has to be made), the President of the Royal College of Surgeons, Edinburgh, and three medical women, resident in Edinburgh, to be co-opted by the other four trustees. Applicants must have studied for at least one year at a school of medicine in Edinburgh, and must be either graduates of a Scottish University or holders of the Triple Qualification. On the present occasion there were three applicants for the prize.

MEDICO-LEGAL NOTES ON THE WORKMEN'S
COMPENSATION ACT, 1906.*

By DR. GEORGE WILLIAMSON, Aberdeen.

ALTHOUGH the Workmen's Compensation Act has been a more prolific source of employment to lawyers than to medical men, still in nearly all important cases the medical aspect bulks largely, and indeed is often the determining factor in settling whether compensation is to be awarded, and if so to what extent. There is no class of medical practitioner who may not be interested in one way or other in these cases, whether as the workmen's club or private medical attendant, the employer's medical man or an expert physician, surgeon, or pathologist called to give an expert opinion or evidence, or as an adviser to an insurance company, or as a medical referee appointed by the Home Office, and none of us can afford to be ignorant of the scope of this Act or of the interpretation put upon some of its clauses by the higher Courts. Our work, too, in connection with these cases is peculiarly difficult, for our opinions and treatment are so often the subject of hostile criticism in the law Courts. So much, too, sometimes depends upon our opinions that a conscientious man cannot help giving a great deal of anxious consideration to some case where perhaps the only reward is a very unpleasant cross-examination in the witness-box, there being no funds to meet any expense of the action. On looking over many of the decisions that have been given, especially the earlier ones, it strikes the non-legal mind that they have been settled more on the principle of benevolence to the workman than on grounds of justice or of common sense. No doubt the intention of the Act was to ameliorate the condition of the working man, and in many of these cases no doubt it has succeeded, but there is a serious danger of legislation of this class telling against a very large section of the working men. Employers must protect themselves, and it must consequently become more and more difficult for that very deserving class who are getting past middle age or who may have some slight physical incapacity to find employment. True, most employers insure against these risks, but insurance companies, though very excellent and quite indispensable institutions, do not exist solely for philanthropic

* Read before the Aberdeen Medico-Chirurgical Society, 6th April 1911.

purposes, and they have been already compelled to seriously raise their rates for insuring many of these risks. At first they had no basis to work upon in fixing their rates, and have found from the claims that have been made and upheld that they have been taking them at unprofitable rates. The burden then comes back upon the employer, and in many cases presses very severely, in fact in some cases very unjustly. For instance, the benefits of the Act apply not only to the legal dependants of an incapacitated or deceased workman, but are extended to the illegitimate dependants, to embrace child, grandchild, parent, and grandparent. It has even been held that a posthumous illegitimate child comes within the scope of the Act. Is this not an incentive to immorality if not also to perjury? for what may prevent any woman from saying that a dead man is the father of her illegitimate child, and when there cannot possibly be any direct proof to the contrary what is an arbitrator to do? When we look at section 1, subsection (2), paragraph (c), we find a provision which seems grossly unjust to the employer—That in case of death or serious and permanent disablement, the fact that the injuries have followed upon serious and wilful misconduct on the part of the workman does not disqualify for compensation. There is no definition given in the Act of serious and wilful misconduct, and as far as I know there is no decision of the Courts or *obiter dicta* of Lords of Appeal giving any definition. It has, however, been held by the House of Lords that this is a question of fact,¹ which has to be settled by the County Court judge or the Sheriff in the first instance, and it is the function of the higher Courts to say whether there is evidence to support this finding. Lord Loreburn, C., thought the word “wilful” meant that the misconduct was deliberate, not merely a thoughtless act on the spur of the moment. “Serious,” his Lordship said, “implies, not that the actual consequences were serious, but that the misconduct itself was so.” In the case of an accident proving fatal or causing serious and permanent incapacity it does not matter how gross the misconduct may be, provided the accident arose out of and in the course of the employment. For instance, if a man go to his work in a state of intoxication and has a fatal accident, such as a mason falling off a scaffold, apparently the employer would have to pay. Such a decision has actually been given in the case of a ship’s steward, who on returning to his ship in a state of intoxication took the wrong gangway to escape observation and fell down a hatch and was killed.² The fact of whether he was drunk or not would have no

bearing on the case, seeing that the accident had a fatal result ; the only question would be, Did the accident arise out of and in the course of the employment ? Is the definition of the word *workman* not also somewhat unfair to all except the so-called working class ? Workman generally signifies one that earns his living by some form of manual labour. In section 13 we find that it applies to any person who has entered into or works under a contract of service or apprenticeship with an employer, whether by way of manual labour, clerical work or otherwise, save that it does not include any person employed otherwise than by way of manual labour whose remuneration exceeds £250 per annum. In other words, a man who works with his brain must not make an income exceeding that amount if he is to benefit under the Act, while a man engaged in manual labour will benefit whatever his income may be, and as tips are apparently counted as part of a workman's earnings it is very difficult to say how many workmen may earn this amount. The following case is of some interest to members of the medical profession :—An Irish district dispensary medical officer was summoned to a case of a gun-shot wound. The case being urgent, there was no time to get a ticket from the clerk to the guardians. On his way he was thrown from his trap, receiving injuries from which he died within two days, leaving a widow and four children destitute. His salary from the guardians was £120 per annum. The widow claimed compensation under this Act. Judge Barry, before whom the case came at the Enniscorthy Quarter Sessions, found that the doctor was a workman coming under the phrase “otherwise,” and awarded the widow and children compensation to the maximum amount. The guardians admitted that the accident arose out of and in the course of the employment, but appealed on the ground that the deceased was not a workman within the meaning of the Act. The Lord Chancellor of Ireland in giving judgment said : “Looking at the terms of section 13 we find that workman means ‘any person who has entered into or works under a contract of service or apprenticeship with an employer by way of manual labour, clerical work or otherwise,’ and we hold that in this case there is no contract of service with an employer within the meaning of the terms of section 13.”³ No doubt this was legally correct, but it is probable that this unfortunate man was the hardest worker in the parish—perhaps, indeed, the only real workman in it.

If we turn now to section 8 we find detailed the method by which a workman who has contracted any one of several diseases

which are detailed in the Third Schedule to the Act may receive compensation in the same way as if he received injury by accident. Along with this section it is convenient to consider the Third Schedule. The first six diseases are those which were scheduled when the Act came into operation, the others have since been added by the Secretary of State, who has the power to add any other industrial disease that he may think fit. In order to make a claim successful, the workman who has contracted the disease mentioned in the first column of Schedule III. must have been employed as detailed in the corresponding space in the second column. For instance, anthrax must occur in one whose employment consists in handling of wools, hair, bristles, hides and skins, and unless the certifying surgeon certifies otherwise, the employer would have to prove that the disease did not so arise. Anyone else contracting anthrax would have to prove that he had sustained injury by accident arising out of and in course of his employment. In the same way scrotal epithelioma would have to occur in a man who was engaged in chimney sweeping, etc. Under section 8, subsection (1), paragraph (f), is detailed the first function of the medical referee.

The First Schedule deals with the scale and conditions of compensation. Subsections (4)-(14) and (15) are of interest. Schedule I., section 15: here is detailed the second function of the medical referee. The Second Schedule deals with the methods of arbitration. Subsections (5) and (15) are of interest. With regard to section 15 of this schedule, the Regulations issued 27th June 1907 lay down that, before making any reference, the committee, arbitrator, or Sheriff shall be satisfied after hearing all medical evidence tendered by either side that such evidence is either conflicting or insufficient on some matter which seems material to a question arising in the arbitration, and that it is desirable to obtain a report from a medical referee on such matter. This question came up before the Second Division of the Court of Session about a year ago.¹ The Sheriff, without hearing any evidence, remitted the matter to a medical referee for report. The workman objected to this and obtained a stated case on appeal. The Court unanimously decided that the Sheriff had no power to make such a remit. Lord Ardwall in giving judgment said: "The purpose of the remit is to enable the arbitrator to obtain the services of a referee who practically may act as a medical assessor, and may, as an expert in medical matters, weigh and decide upon the effect of the evidence of fact and of opinion which has been led in the

arbitration, and give his impartial opinion thereon. In short, the remit contemplated by the section and the Regulations is not one for the purpose of obviating proof by being substituted for it, but for the purpose of assisting the arbitrator to arrive at a just decision on evidence that has been taken."

It must be observed that under the Act compensation is only to be paid for actual loss of earnings, and nothing can be awarded for pain or suffering of any kind. As will be seen later on, there is great difficulty in dealing with cases where there is no longer for the present any loss of earning capacity, but where in the future there is likely to be incapacity arising as a result of the accident from which the workman has just recovered. In cases of this kind suspensory awards have sometimes been made so as to keep the case open.

Where a workman has sustained a fatal accident, no compensation is to be paid unless he has left dependants. Apparently no claim can be advanced by any relatives unless they have been to some extent dependent upon the deceased workman. In such cases, however, a sum not exceeding £10 may be claimed, which sum is to be divided between the deceased's medical attendant, if there was any medical attendance necessary on account of the accident, and the undertaker. The greatest number of interesting medico-legal cases have arisen out of the interpretation of the clause, "personal injury by accident arising out of and in the course of the employment." What, then, is an accident within the meaning of the Act? It has been defined in the House of Lords by Lord Macnaghten as an "unlooked-for mishap, or an untoward event, which is not expected or designed."⁵ In giving the leading judgment in the well-known case of *Clover, Clayton & Co. v. Hughes*,⁶ where the workman dropped dead while tightening a nut with a spanner, and where the autopsy revealed that death was due to the bursting of a large aortic aneurysm, the Lord Chancellor, after remarking that this definition of accident was accepted and practically agreed upon, went on to explain what in respect of this case was the meaning of the word "unexpected." "The relevant sense of the word unexpected is that a sensible man who knew the nature of the work would not have expected it, and that it is not sufficient to make the event expected that a medical man who was acquainted with the man's condition would have expected it." Lord Macnaghten, in concurring, said: "The fact that the result would have been expected or indeed contemplated as a certainty by a medical man of ordinary skill, if he had diagnosed the case,

is, I think, nothing to the purpose." Lord Atkinson, on the other hand, in giving reasons for his dissent from the finding of the majority in the same case, said: "The rupture was the certain or the highly probable result of the slightest muscular exertion. It may not have been looked for or expected by the deceased, his employers, or his fellow-workmen. There is no evidence that he or they knew or suspected what his condition was; but the ignorance of such people on this point cannot turn, I think, the inevitable or highly probable result of a disease or hidden condition of body into an 'accident.' Neither can, in my opinion, the fact that the final catastrophe consisted in the rupture of a tissue, if that catastrophe be known to be the certain or highly probable result of the malady. In order that the mishap may be unlooked for, or the event be unexpected, so as to make an injury by accident within the meaning of this Act, the mishap must, I think, be unlooked for, or the event be unexpected by some person with knowledge of the facts and capable of judging reasonably of them." I will not be so bold as to say which of these opinions is right, although I think the latter would be more in keeping with the view of most medical men. If the former is correct, why is not any sudden death an accident? and, consequently, why should not the executors of any man who dies of aneurysm while walking on the street, provided he does not know of his danger, claim payment under an accident policy if such exists? No doubt it would be answered that the definition applied only when "accident" was considered under this Act.

With regard to the significance of the word "designed" there would be a similar difficulty. No doubt if the workman himself intentionally produced his own injury, such would not be an accident within the meaning of the Act. Where, however, the injury is the result of an intentional act of another person, fellow-workman, or stranger, there would be greater difficulty. Several cases that have come before the Courts illustrate this, but as they also illustrate the meaning of the next qualifying phrase in the section, we must consider it at the same time. It is not enough for a successful claim that the injury is an accident; it must be an accident arising out of and in the course of the employment. "There must be some relation of cause and effect between the employment and the accident as well as between the accident and the injury." An extraordinarily wide interpretation has been put on the clause "arising out of" by the Lord Chancellor, where he says: "An accident arises out of the employment when the

required exertion producing the accident is too great for the man undertaking the work, whatever the degree of exertion or the condition of health."⁷ The great importance of this definition will be seen when considering cases of pre-existing disease affected by accident. "In the course of" would appear to mean that the accident must occur during the time the man is at his work, or, more correctly, during the time the relation of master and servant exists, *i.e.* the liability may begin before the work has begun and may last during an interval such as a meal hour under certain circumstances, and may continue after the work has ceased. The following cases illustrate these various points:—An engine-driver was injured by a stone which was dropped by a boy from a bridge on to the engine, the stone breaking the cabin window and striking the driver, causing shock, followed by death. The Appeal Court held that this was an injury by accident arising out of and in the course of the employment—that the Legislature intended to provide for risks of accident which are within the ordinary scope of the particular employment in which the workman is engaged. The test is, Was the risk reasonably incident to the employment? One can quite understand what an attraction a train has for boys as it passes under a bridge, and it is not unnatural that they should try to drop something on it, hence there is a special risk to the driver and fireman.⁸ Before the same Court came a case where three of a number of boys engaged at carriage painting were concerned. *A.*, one of the boys, was injured by *B.*, another of the boys, who was pushed into the pit at the works by *C.*, another of the boys. *B.* threw a piece of iron at *C.*, which, missing *C.*, struck *A.* and injured him. The Court held that the act was one which had no relation whatever to the employment of any of the boys, remarking: "The statute does not provide an insurance for the workman against every accident happening to him while he is engaged in the employment of his master, but only against accidents arising out of and in the course of that employment."⁹ A workman employed at a biscuit factory was slung up by two of his companions for a lark, who fixed the hook of a crane into his necktie. The result was that he fell a distance of 50 feet and was seriously injured.¹⁰ The Court held that this was not an accident arising out of the employment. Lord Justice Buckley remarked: "The accident had nothing to do with the employment; it was a tortious, senseless act, done by a fellow-workman, and on every ground of common sense the employer was not liable." With the decision I should think everyone would agree; but

though his Lordship calls it an accident, was it really so, according to the definition? The foolish act was designed although the untoward event was not, but the latter could hardly have been unexpected, even by ignorant people. A case at present under my own observation illustrates this point as well as the fact that an employer once having paid compensation could not afterwards take up the position of saying the injury was not an accident arising out of and in the course of the employment. A boy in the service of very large employers who do not insure their workmen had a severe cut to his wrist, which he received by getting his hand thrust through the glass panel of a door while he was trying to prevent a fellow-workman fastening him into a shed. His injuries are of a serious nature and will permanently incapacitate his right hand to a large extent. He was paid full compensation for six weeks, when he returned to work, being quite able to do the same work as before. After working a few weeks he was dismissed from the service for serious neglect of duty and insubordination, not for incapacity for work. He now claims compensation, and his employers are to pay, as they already, by paying compensation, virtually admitted that it was an accident, and that although it did not arise out of the employment, yet the boy was probably entitled to use all means to prevent his being locked into the shed and thus kept away from work. In the case of a railway ticket collector who jumped on to the footboard of a moving train to speak to a friend of his own, and who in jumping off was killed, it was decided that the accident was not one arising out of the employment, as what he did was done for private purposes of his own.¹¹ That the liability continues beyond the actual hours of work, under certain circumstances, is shown by the following cases:—A workman had to go to his work by a train which took him there twenty minutes before the time for starting work. He generally spent the time in a mess cabin which had been erected for the convenience of the workmen. On going to hand his ticket into the office before going to the cabin he fell into a hole, which had been dug over a water-tap, and was injured. The Court held that this was an accident arising out of and in the course of the employment.¹² A workman was eating his dinner in a stable where he was employed when the stable cat bit him; this was followed by septicæmia. The Court held that the accident arose out of and in the course of the employment, the cat being part of the stable furniture, but it was remarked that if the cat had been a strange one the case would have been quite different.¹³

Is an assault an accident within the meaning of the Act? In the Irish Court of Appeal the case came up¹⁴ of a gamekeeper who, on going out at night in discharge of his duty, was attacked by three poachers and injured. The arbitrator had found that the injuries were received in the course of and arose out of the employment, but they did not constitute an accident within the meaning of the Act. In the Appeal Court the majority were of opinion that the occurrence constituted an accident within the meaning of the Act. Lord Justice Cherry dissented on the ground that such injuries as were inflicted were not unforeseen or undesigned, and that the absence of design or intention was the essential element of an accident. You will remember the case of a cashier who was murdered in a train near Newcastle. He was in the habit of carrying large sums of money with him, and no doubt this was a great attraction to criminals. His widow was awarded compensation, the Court holding that murder was an accident from the standpoint of the person who suffered from it, and that it arose out of an employment which involved more than the ordinary risk.¹⁵

Suicide during Insanity following upon an Injury.—A workman who had lost the sight of one eye met with an accident which involved loss of sight in the remaining eye. He thereafter became insane and committed suicide. His widow claimed compensation from his former employers under the Workmen's Compensation Act, 1897, alleging that the cause of death was an accident arising out of and in the course of the employment. The Court held that the cause was too remote, the Lord President remarking: "The claimant will have to do something more than say that there was a possibility of death arising from such an injury in such a way—she must show that it was in fact the result of the injury."¹⁶

It would appear that there must be some definite point of time at which an injury occurs to constitute an accident. The gradual onset of a disease is not an accident within the meaning of the Act, even though it has been caused by the nature of the employment, although provision has been made for the inclusion of certain industrial diseases within the benefits of the Act. In cases of beat-hand¹⁷ and beat-knee,¹⁸ which are now in Schedule III., Collins, M.R., said: "In each case the injury was caused by the gradual process of continued friction; the accident must be something which is capable of being assigned to a particular date, and which is in the popular and ordinary sense an accident."

Again, the proximate, not the remote, cause is the one that has to be considered. In the case of a workman, an epileptic, engaged standing on a plank over the hold of a ship, guiding the bucket at the end of a chain and signalling to the man working the crane, who took a fit, falling into the hold of the ship, it was held that he had sustained an accident arising out of his employment, as it was the fall and not the fit which gave rise to the injury.¹⁹ Other cases of injury to epileptics have been decided in the same way.

The same opinion was expressed by Lord Justice Fletcher Moulton in a case which will be mentioned later.²⁰ The workman suffered from frost-bite in his hand, and it was argued for the employer that the man had a tendency to gout. The judge said: "The question whether the man had or had not a tendency to gout is to my mind immaterial to the issue in this case, for there is no doubt that the cold was the immediate and proximate cause of the injury; and the decisions have established that in such a case the fact that there was an inherent weakness of constitution in the workman does not take away his right to compensation for the injury." Lord Chancellor Halsbury has stated that idiopathic disease is not an accident. He, however, held that contracting anthrax under certain conditions was an accident. In the interesting case of *Brintons v. Turrey*,²¹ which was an appeal to the House of Lords, and in which the infection was alleged to have taken place through the conjunctiva where there was no wound of any kind, the majority held that the man died of an accident arising out of his employment. This case came under the Workmen's Compensation Act, 1897, anthrax now being scheduled as an industrial disease. Lord Halsbury said: "A personal injury by accident excludes and was intended to exclude idiopathic disease, but then if some part of our physical frame is in any way injured by an accident, we must be on our guard that we are not misled by medical phrases to alter the proper application of the phrase 'accident causing injury,' because the injury inflicted by accident sets up a condition of things which medical men describe as a disease." His Lordship then instanced the hypothetical cases of a tack puncturing the foot and being followed by tetanus, and of an injury to the head being followed by septic pneumonia. Lord Macnaghten, in agreeing, said: "The accidental character of the injury is not, I think, removed or displaced by the fact that like many accidental injuries it sets up a well-known disease, which was immediately the cause of death." Lord Robertson, in stating

reasons for dissent from the finding of the majority, said that there was a difference between the case before them and the postulated cases of tetanus and pneumonia, for in the illustrations there is postulated an accident distinct from the disease, while in the case before their Lordships the accident, so called, was simply the inception of the disease. This might perhaps be described as "excess of subtlety," but I think it is a very real and important distinction. If the entrance of the anthrax micro-organism through the conjunctiva without any suggestion of there being any abrasion is to be counted an injury by accident, why exclude cases of diphtheria or any other disease which is supposed to be due to the entrance of micro-organisms? In the case of a wool-sorter,²² who had a pimple on his neck which he said had got rubbed by his collar, and which got inoculated with anthrax, it was held that he had received personal injury by accident within the meaning of the Act. On the other hand, it has been held that sewerman's enteritis, contracted while working in a sewer, was not injury by accident, as the enteritis was contracted gradually in the course of the employment, it being the long-continued inhalation of the sewer gas which brought on the illness.²³ But is it not possible that the sudden and unexpected inhalation of concentrated sewer gas might bring on enteritis in a person who is susceptible and unaccustomed to the work? If so, why should this not be injury by accident? An interesting question was raised by a correspondent in the *British Medical Journal* a few years ago. He states that he was in attendance upon a domestic servant who had an abortion, stated to have been brought on by strain at her work, and that this woman had informed him that she meant to claim compensation from her mistress. Whether she did so, or whether such a claim ever came before a Court, I do not know—I can find no trace of such—but the question is a very interesting one. A later correspondent in answer to this pointed out that such a claim could never be allowed by any Court, as it could never be the intention of the Legislature to encourage immorality, and that this woman, being presumably unmarried or a widow, would be guilty of serious and wilful misconduct in becoming pregnant. This latter gentleman's subtle reasoning is, however, clearly at fault, because the serious and wilful misconduct had nothing to do with the abortion, which is supposed to be the result of strain at her work. I do not see how, provided there was a history of strain at her work, a Court could refuse to award

her compensation, judging from some of the decisions of the House of Lords.

It is interesting to contrast the decisions in two cases of alleged personal injury by exposure to excessive heat and cold. A man was engaged painting a ship in the tropics and was thereby exposed to the heat of the sun more than he would otherwise have been. He died from the effects of sunstroke, and it was held that he died from an accident.²⁴ On the other hand, a journeyman baker, part of whose duty it was to go out with his master's cart to deliver bread, while following this part of his work on one particularly cold day was attacked by frost-bite in his right hand. This hand seems to have been more exposed on account of his having to take off his glove to give his customers change, a proceeding which was held by the arbitrator to be unnecessary although convenient. The Court of Appeal²⁰ held that this was not an accident arising out of the employment, as, even admitting that there was an accident within the meaning of the Act, which was doubtful, it did not arise out of the employment, because the applicant had not been exposed to any greater extent than other drivers of vehicles and other persons engaged in outdoor employment on that particular day. The Master of the Rolls (Cozens-Hardy) in giving the leading judgment said: "It is not enough for the applicant to say the accident would not have happened if I had not been engaged in that employment or if I had not been in that particular place;" he must go further and say "the accident arose because of something I was doing in the course of my employment or because I was exposed by the nature of my employment to some peculiar danger." Lord Justice Fletcher Moulton in dissenting, said: "The applicant here can indicate the day, time, circumstance, and place in which it occurred, so that it bears no similarity to an industrial disease. The *dictum* of Lord Maclaren has more than once been approved of in the House of Lords, viz.: 'If a workman in the reasonable performance of his duties sustains a physiological injury as the result of the work he is engaged in, this is accidental injury in the sense of the statute.'" The point as to whether the workman is in the course of his employment specially exposed to danger being the test is well illustrated by the decisions in the following two cases of death from lightning:—A man working on a scaffold was struck by lightning and fell to the ground, a distance of 23 feet, being killed in consequence.²⁵ It was held that the injury was an accident arising out of the employment, on the ground that being

on this scaffold he was specially exposed to such a danger. The Master of the Rolls (Collins) said: "If there is, under particular circumstances, in a particular vocation something appreciably and substantially beyond the normal risk which ordinary people run, and which is a necessary concomitant of the occupation the man is engaged in, then I am entitled to say that the extra danger to which the man is exposed is something arising out of his employment." Compare with this the case of a workman engaged cutting gullies at the roadside to prevent flooding during a storm who was struck by lightning and killed.²⁶ The Irish Appeal Court held that he did not die by accident arising out of his employment, on the ground that he was not exposed to any greater extent than any other outside worker.

It has been doubted whether nervous shock without actual physical impact of any substance against the workman's body could be regarded as an accident. No such case, as far as I can find, has come under the Act, but a case coming up under an insurance policy against accident was decided as if such an occurrence would be held to be an accident.²⁷ A railway company had established a system of insurance for the benefit of their servants, who contributed to it. One of their servants, a signalman, saw a train coming and noticed that there was something wrong with one of the carriages. He was much alarmed, but by waving his flag frantically he attracted the attention of the engine-driver and the train was stopped, an imminent disaster being averted; but the signalman completely lost his nerve, and was quite incapacitated for work for a year. The Court of Appeal held unanimously that this was an accident within the meaning of the policy. Lord Justice Kay: "It seems to me as clearly an accident as if he had been knocked down by a passing train." At the same time it has been settled that mere mental pain unaccompanied by any physical injury is not cause for action.

The Relation of Accident to Disease.—(1) As cause. An accident may give rise to various diseased conditions, but the most frequent to come up under the Act are cases of infection, either occurring at the time of the accident or coming on some time after, such as septicaemia, tetanus, etc. Some of these are of great medical importance, as the incubation period of these diseases may regulate the finding of the Court. A workman developed erysipelas fourteen days after an injury and died ten days later. The medical evidence for the workman admitted that the incubation period was less than ten days, so that the infection did not occur at the

time of the accident, but later. It was held, however, that no *nexus actus interveniens* had occurred to displace the old cause and substitute a fresh one for it, consequently the man died by accident. In the case of a domestic servant,²⁸ who said that she had hurt her finger while cleaning a stove in the morning, and that by the same evening her arm was much swollen and tender, with red lines running up the arm and swelling under the armpit, the defence was that she was suffering from whitlow before the alleged accident, as such symptoms could not have occurred within twelve hours of the injury. It was held that the whitlow did not result from the accident. A workman received a punctured wound of the hand, was away from work several days near the end of April, when he resumed work, having quite recovered. Early in July he came home with a swollen face, which turned out to be erysipelas, and he died on 17th July. A claim was made by his dependants, who alleged that the fatal illness was the result of the original accident. A medical assessor was called in, who gave it as his opinion that it was possible that micro-organisms which entered the man's hand in April might lie latent for a long time.²⁹ The arbitrator held that death was due to accident. On appeal the decision was reversed. The Master of the Rolls (Cozens-Hardy) remarked that there was not a particle of evidence to justify the finding of the County Court judge.

(2) *Where an Injury Aggravates an Already Existing Disease.*—In the case of *Lee v. Baird*³⁰ Lord Mackenzie said: "It is the law that if a man who is already afflicted with an infirmity is injured by an accident and thereby incapacitated from carrying on the work which he was previously fitted to do, then that is an injury which results from the accident, even though the accident would not have incapacitated him had he been otherwise sound." There is almost no disease which may not be alleged either to be the result of an accident or to be at least aggravated by accident. Perhaps the condition which has given rise to more claims under this Act than any other is hernia. There has been long a prevailing idea among the public, shared to a large extent by members of the medical profession, that rupture is a very frequent result of a sudden and severe strain. It has even been alleged and held by Courts that a blow on the abdomen may produce a hernia by raising the intra-abdominal pressure. Any case of this kind, I think, would now be looked upon with great suspicion. The more frequently alleged cause is a strong muscular effort, such as lifting a heavy weight, and although it

is probably now the accepted view that a hernia occurring *de novo* as the result of a strain is an extremely rare event, yet according to the accepted definition of the word accident any sudden increase in an existing hernia or the sudden appearance of a hernia during or immediately after any strain would be looked upon as an injury by accident. It is not the purpose of this paper to go into the signs of a recent as against an old hernia, although in practice this is a most important consideration. Here it is more necessary to consider what effect the presence of a hernia has upon a workman's capacity for work. At many occupations a man may be able to earn the same wages as before if he can be fitted with a well-adjusted truss. At the same time there are risks to such a man, and either through carelessness or continued hard work or many other causes he may become to a large extent incapacitated, so that in any case where a radical cure is not submitted to, or thought not to be a safe proceeding, how are the rights of such a man to be preserved? In the English Court of Appeal it has been customary to award a nominal sum as compensation, usually a penny per week, so that the case is kept open, and when the workman does become incapacitated he can apply to have the award increased. A seaman who was ruptured at his work after some time had so far recovered that he was able by wearing a truss to resume his usual work. The County Court judge made an order terminating this man's compensation. The Court of Appeal, however, said this could not be done,³¹ the wearing of a truss not constituting a cure. A penny a week was awarded. A like decision was come to in a case where a ruptured seaman was declared by the medical referee to be quite fit for work provided he wore a well-fitting truss, and where the County Court judge thereupon ended compensation.³² The Court of Appeal held that in a case of this kind where a man has been ruptured, though by wearing a truss he may be physically able to earn full wages, still the circumstances are such that there is a possibility, if not a probability, that in the future there will be bad effects resulting from the accident which will affect his earning capacity. So in such a case there should be a suspensory award of a penny a week. This method has never found favour in the Scottish Courts, and it is of interest to compare with those English cases the following case which was heard in the Court of Session³³ before a special court of seven judges some months ago:—The workman, a mason, was engaged demolishing an old tenement when a wall upon which he was standing gave

way and he fell to the basement of the building, fracturing several ribs, sustaining severe bruises, and, as alleged, a double rupture. The arbitrator made a remit to a medical referee with consent of both parties and without hearing any evidence. Surely, in agreeing to this, the employer's advisers made a serious mistake, for I take it that thereby they practically admitted that the double hernia, which was the important disabling condition, was the result of the accident. I should hardly think they could get expert medical opinion to support this view. The remit to the medical referee was as follows:—"Whether in so far as medical examination can show the applicant is still totally incapacitated for work, whether he has recovered his whole capacity for work, or whether he has only partially recovered his capacity for work, and, in this last event, what proportion of his former capacity for work he has recovered." The medical referee replied—(1) The applicant is not incapacitated for work; (2) he is able for his ordinary work. On receipt of this report the arbitrator caused a further communication to be sent to the medical referee inquiring whether he still adhered to his report in the light of there being double rupture admittedly the result of the accident. The medical referee replied that he did so, but that he thought it right to say that the ruptures might and probably would increase in degree and become detrimental to him. The arbitrator thereupon continued compensation, but reduced the amount by one-half. On appeal the Lord President said: "I understand that your Lordships of the Second Division sent this case for consideration by seven judges in order that what is known as the penny a week question might be reconsidered. Certainly, if ever there was a case in which the device of awarding a penny was competent, this is a most appropriate case in which to do it. In the case of *Clelland v. Singer Manufacturing Co.* I gave with considerable minuteness my reasons for coming to the conclusion that the device for awarding a penny at a time when the man was not for the present physically incapacitated for working was a device for which there was no statutory sanction, nay, was, in my view, contrary to the obvious scheme of the statute." The finding of the Court was that compensation must cease. Disease of heart and vessels is responsible for a very large number of compensation claims. In reading over the judgment in the classical case of *Clower, Clayton & Co. v. Hughes*⁶ one can scarcely see how any case of a workman with diseased vessels, happening either to die while at work or to suddenly be

incapacitated, could fail to receive compensation. In this case it was stated in medical evidence that the aneurysm might have burst at any moment, even during sleep; that the wall of the sac was extremely thin; and that the man should have been in bed instead of at work. It was also stated that the strain was very slight; he had only turned the spanner twice, and it was only on the third turn that there would have been any exertion at all, six turns being required to fix the nut tightly. The point was that if the work contributed in the slightest degree to the rupture it was an accident arising out of the employment. This overrules all previous decisions, such as the case of *Hensley v. White*,³⁴ where a workman, in trying to turn a wheel to start an engine, suddenly had severe pain in his stomach and died soon afterwards. The autopsy showed that he had a duodenal ulcer. In this case the wheel was more difficult to move than usual, because it was the first day of work after Christmas holidays. The Court of Appeal held that the man died of disease, not of accident. A workman who had diseased arteries whilst doing his ordinary work became giddy and lost power in the arm and leg of one side;³⁵ the diagnosis was cerebral hæmorrhage. He remained at home and in bed, where in a few days he took a second attack, causing complete paralysis of one side. Lord McLaren said: "Unless we had evidence which would enable us to assign a different origin to the second attack, I think the logical deduction from the evidence is that the man's improvement was only a partial recovery from the first attack, which was caused by the arteries of the brain being in a strained condition in consequence of over-exertion, and that the second attack was a further development of the injury he suffered from over-exertion." Lord Kinnear: "This man suffered from bursting of a blood-vessel whilst trying to lift a weight too heavy for him; that it might or might not have been too heavy for a man whose arteries were in a sound condition is nothing to the purpose." It would seem as if no allowance were made for the fact that most men work at least a third of the whole time, and that consequently, on the doctrine of chances, a good many of these accidents should happen during working hours without being in any way due to work. It would be interesting to know how the Courts would look on the case of a cashier who was attacked by cerebral hæmorrhage while balancing his books. I have not been able to find any such case. The decision of the House of Lords in *Barnabas v. Bersham Colliery Co.* seems to have been based more on common sense, although it

has not yet been reported in full.³⁶ The workman was engaged building a wall which necessitated his lifting stones of various weights. He was seized with apoplexy, stated to be due to cerebral hæmorrhage, and died. Apparently he was not actually seen to fall, but was found by a fellow-workman in a dazed condition. Finding was that there was no evidence to show that the workman died from an accident arising out of his employment.

A local case of some interest was recently settled, where it was alleged that the workman, who admittedly had diseased vessels, died of cerebral hæmorrhage on account of his having worked for thirty consecutive hours with only short intervals for meals. There was no history of any sudden strain, the workman being found in a shed in a somewhat dazed condition.³⁷ The arbitrator held that the hæmorrhage was not caused by any sudden strain or jerk on the part of the deceased. It was not proved that the hæmorrhage was due to the long period of continuous work which deceased had undergone, and his death was not caused by any accident arising out of and in the course of his employment within the meaning of the Act.

It seems to me that one of the weak points of the Act from the workman's point of view is the failure to make any provision by Statute for workmen who are permanently damaged by accident although they are able for the time to earn their old rate of wages. Take the case of a man who has had one eye destroyed by accident. In certain trades he might with his former employer earn his old rate of wages, but he is not of the same value in the labour market, as if through dulness of trade or some other cause he loses his employment it would be difficult for him to find fresh employment at the same rate of wages, for even if he could work as well there is greater risk of accident to such a workman.

Supervening Cause of Incapacity. How does such an Occurrence Affect the Question of Compensation?—This question is answered by a decision in the Court of Session.³⁸ A workman while receiving compensation was attacked by heart disease, which the arbitrator held was by itself sufficient to cause incapacity, and he therefore ended the compensation. On appeal Lord McLaren said: "It was quite competent for the employer to prove, if he could, that the original cause of the disability had ceased, and that a new cause had supervened, and if he had succeeded in proving that, the arbitrator would have been warranted in declaring the compensation ended. I think it rests on the employer to prove (1) that the supervening cause was not connected with the original injuries;

(2) that the original injuries have ceased to operate as an effective cause of incapacity." A very common difficulty in practice arises where old age supervenes, causing incapacity. The same rule would have to be observed, and the employer would have to prove that the original cause of incapacity had ceased to operate, and that incapacity was solely due to old age. I have had such a case under observation for several years. An old man had a fall from a ladder and bruised his hip. There are now rheumatoid changes in that hip joint, but the chief cause of incapacity is old age. He is very feeble, still it is impossible to say definitely that the accident is not still an effective cause of incapacity, so the insurance company continues to pay compensation. The following case is of interest in this connection:—A workman who was to undergo a surgical operation for the relief of incapacity³⁹ requested the surgeon to remove a painful tooth at the same time. The chief operation was safely over, and the patient showed some signs of coming out of the anæsthetic, when the surgeon remembered about his promise to extract the tooth. A little more anæsthetic was given for this purpose, when the workman suddenly died. The Court held that the employers were not at all liable for compensation to this man's dependants, because the second operation had nothing to do with the man's injuries.

Treatment.—In order that compensation may be continued, an injured workman must submit to any reasonable treatment for the relief of his incapacity—that is to say, he must behave reasonably, and the onus of proving that he is not reasonable rests upon the employer. A man would never be considered unreasonable if he followed the advice of his own qualified medical adviser—nor is it necessary that he should employ a specially skilled surgeon—and he would not be responsible for any mistake in diagnosis or treatment by his own medical attendant. In the case of a domestic servant who fell downstairs in the performance of her duties and fractured her clavicle,⁴⁰ and who was taken to hospital at the time and who never returned there or had any other medical treatment, and in whom at the end of three months it was found that there was no union of the bones, the judge held that eight weeks was a reasonable time for the cure of a fractured clavicle, and allowed compensation for that time but no longer, holding that her continued incapacity was not due to the injury but to her own unreasonable conduct. On a previous occasion⁴¹ I pointed out that the Scottish Courts had laid it down that an injured workman, as a condition of the continuance of compensation, must submit to

any simple operative procedure which is practically free from risk, and which, in the opinion of medical experts, is likely to effect a cure, such an operation for instance as any man of ordinarily manly character would undergo for his own good where no question of compensation existed. Since then the English Appeal Court has given a decision on these lines in the case of *Warneken v. Morland & Son, Ltd.*⁴² In this case the incapacity was shown to be due to a small piece of bone left in the stump of the great toe. The Master of the Rolls (Cozens-Hardy) remarked: "Though a man could not be compelled to undergo an operation, it could be said that the continuance of his incapacity would be due, not to the original accident, but to his own unreasonable conduct in refusing to undergo this trivial operation." Here the man was unreasonable, consequently his compensation would be ended unless he submitted to the operation. On the other hand, it is certain that if there appeared to be any appreciable degree of risk attending such an operation, and if there were not practically unanimous medical opinion that such operation would at least diminish to a very considerable extent the incapacity, no Court would withhold compensation if the workman refused to submit. It is also clear that if the incapacity were increased after the operation, or if the patient died from the operation, the employer would be held responsible.

Statutory Operation.—When a workman engaged in processes in the manufacture of glass involving exposure to the glare of molten glass acquires what is called glassworkers' cataract—a posterior polar cataract—he is allowed compensation for a period of four months, and if he submits to an operation this period of compensation is extended to six months. This is the only circumstance in which there is any statutory compulsion or special encouragement to undergo a surgical operation.

An injured workman after giving notice of a claim must submit himself to examination by a medical man provided and paid by the employer, and he must do so without any unnecessary delay. If such delay occur compensation may be withheld during such time. Where a workman refused to be examined by the employer's medical man at the time the latter called, saying he would submit if the doctor returned in the afternoon, when his own medical man would be present, it was held to be no refusal to submit. In a recent case which was appealed to the Court of Session⁴³ a workman refused to submit himself to examination by a medical man provided by the employers unless his own

medical man was present. The judges held unanimously that, apart from any special circumstances in a particular case, a workman was not entitled to have his own doctor present throughout the examination by the medical practitioner on behalf of the employer, in terms of section 4, Schedule I., and that the refusal of the workman to submit to examination unless his own doctor was allowed to be present amounted in the circumstances of this case to a refusal in terms of section 4. It was, however, remarked that it was quite conceivable that under some circumstances it would be very desirable that the man's own doctor should be present. A workman must also submit himself to an examination by a medical referee to whom the case has been referred at a place and time convenient to the referee, of which due notice has been sent to the workman. Where a question between the employer and workman has been submitted to a medical referee the latter shall grant a certificate as to the condition of the workman and his capacity for work, and that certificate shall be conclusive evidence as to the matters so certified, and where a claim is finally settled on the certificate of a medical referee that incapacity has ceased from a certain time, and where this opinion has turned out to be erroneous, the case cannot be again opened up unless it can be shown that the opinion was not given in good faith. Lord Justice-Clerk: "I cannot hold that, where a doctor gives an opinion on which parties act on compromising a case for a certain sum, the fact that his opinion proves to be erroneous entitles a party to set aside the settlement made, on the ground of essential error."⁴⁴ On the other hand, as long as the award is open, the medical evidence can always be subjected to review, and fresh expert evidence can be obtained every time a review of the case is granted. It would seem that a medical referee has nothing to do with whether a workman has met with an accident within the meaning of the statute, but that his report must be confined to purely medical matters. In a case which came before the Sheriff Court at Dunfermline a dispute had arisen between the workman and the employer as to (1) the extent of the injuries, and (2) whether there was an accident or not. The employer agreed to refer the whole case to a medical referee, but the workman refused to go before the medical referee until the employer admitted that he had sustained injuries by accident.⁴⁵ The Sheriff held that the workman was justified in refusing, and found the employer liable in expenses. It has been held by both the English and Scottish Courts that an arbitrator has no power to

find that a workman will have recovered by a certain future date and that his incapacity will have ceased by that date. Lord President Dunedin: "The function of the Sheriff in assessing compensation is to have regard to the man's state at present, and he is not entitled to pronounce judgment beforehand, the validity of which depends on a man's condition at a future date."⁴⁶

In a case⁴⁷ before the English Appeal Court in which the arbitrator, acting on the report of the medical referee that a workman would have recovered at the end of three months and would then be able to earn his full wages, awarded the workman 8s. per week till that time and 1d. per week thereafter, the Appeal Court held that the arbitrator could not do this. The Master of the Rolls (Cozens-Hardy) remarked that in his opinion it was not competent for the arbitrator to make such an award: by doing so he (1) assumed the *role* of a prophet, and (2) what was more serious, he threw the onus of having the case reviewed on the workman instead of on the employer, which was contrary to the spirit of the Act.

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THE BLOOD-PRESSURE IN ANÆSTHESIA.

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II.

IN a previous paper* we recorded the results of observations on the blood-pressure during the administration of various anæsthetics, particularly those suitable for short operations.

We now propose to supplement these observations by a series of observations on the pulse-rate made during the course of anæsthesia induced by the same substances.

By a comparison of the average results we are able to obtain information which either of the observations alone fail to give. Simultaneous observations of pulse-rate and blood-pressure on the same patient would of course have been of greater value, but we found them impracticable owing to their liability to inconvenience the operator.

As before, one of us (W. G.) conducted the administration and noted its general effect on the patient ; another (H. S. R.) counted the pulse-rate, which was recorded every 15 seconds by the third observer.

In the tables the first column indicates the pulse-rate per minute at the time indicated. The second column (in heavy type) expresses the pulse-rate as a percentage of the rate noted before the administration of the anæsthetic.

In the charts the broken line indicates the percentage variations of the pulse-rate at the time indicated ; the continuous line indicates the percentage alteration of the systolic pressure as read from the brachial artery.

Nitrous Oxide.—This anæsthetic was administered in two ways :
1. With valves. In this method the patient inhales gas and expires through valves, so that in a short time his residual air is washed out by gas and he is totally deprived of air for the time being. The face-piece was removed in from 60 to 70 seconds.

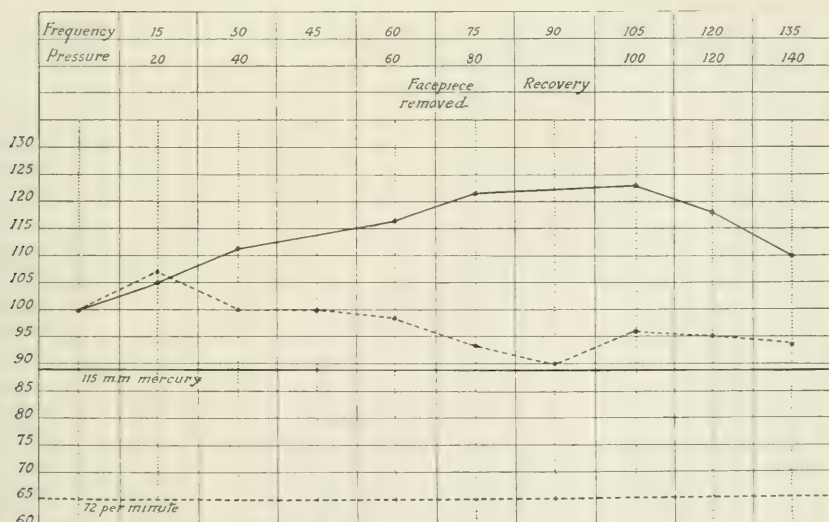
* *Edinburgh Medical Journal*, March 1910.

TABLE I.—GAS WITH VALVES.

No.	Sex.	Age.	Initial Rate.	SECONDS.															
				15	...	30	45	...	60	...	75	...	90	105	...	120	135	150	...
1.	M.	15	80	92	115	92	115	...	104	130	100	125	100	125	92	115	92	115	...
2.	F.	16	128	128	100	120	93	116	90	116	90	100	78	108	84	116	90	124	97
3.	M.	19	112	116	103	104	92	100	89	80	71	82	78	96	85	112	100	104	92
4.	M.	19	88	96	109	88	100	96	109	112	127	108	122	112	127	112	127	104	118
5.	M.	10	88	108	122	112	127	112	127	112	127	116	130	108	122	108	122	108	122
6.	M.	49	96	96	100	104	108	104	108	100	104	96	100	100	104	88	91	88	91
7.	F.	24	128	...	...	112	87	120	93	112	87	104	81	108	84	112	87	112	87
8.	F.	16	132	140	106	140	106	136	103	116	89	92	70	84	63	92	70	96	72
9.	M.	13	140	124	88	116	82	116	82	121	88	120	85	...	128	91	124	88	...
10.	M.	11	104	112	107	...	104	100	...	...	92	88	88	84	100	96	100	96	...
Aver.	.	19.2	110	118	107	110	100	111	100	108	98	102	93	100	90	106	96	105	95

CHART I.—GAS WITH VALVES.

SECONDS AFTER BEGINNING OF ADMINISTRATION.



The average systolic pressure before administration was 128.5 mm. mercury.

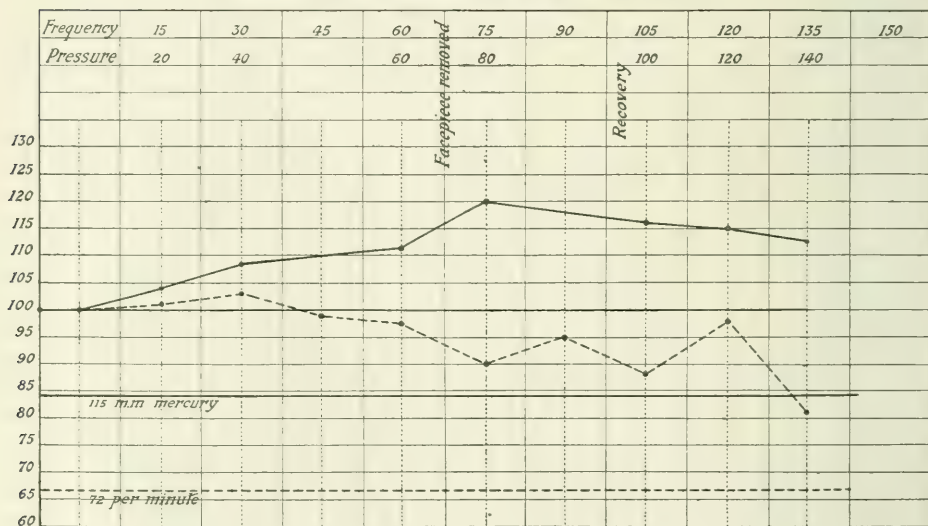
2. Re-breathing. In this method a two-gallon bag is filled with gas. The patient breathes in and out of this bag and thus re-breathes air which contains a certain though diminishing proportion of oxygen.

TABLE II.—GAS REBREATHING.

No.	Sex	Age	Initial Rate	SECONDS.																							
				15	30	45	60	75	90	105	120	135	150	165	180												
1.	M.	21	88	92	104	92	104	92	104	92	104	100	113	104	116	104	116	104	116	92	104	88	100	88	100	...	
2.	F.	19	112	116	103	116	103	98	88	98	88	92	82	92	82	84	75	76	67	76	67	92	82	...	...
3.	F.	28	128	124	97	108	84	108	84	108	84	108	84	112	87	100	78	100	78	100	78	92	72	92	72	92	72
4.	F.	12	136	136	100	124	91	120	90	120	90	96	70	...	96	70	...	...	...	...	104	76	...	...	...	...
5.	M.	30	92	80	86	92	100	100	168	100	168	100	108	112	121	100	108	80	87	80	87	...	...	...	...	...
6.	M.	19	88	76	96	84	95	88	100	88	100	96	109	96	109	84	95	96	109	72	81	72	81	...	...	...
7.	F.	20	116	132	113	132	113	108	93	92	79	96	83	100	96	116	100	120	103	...	...	...	...	...	...	...
8.	M.	28	72	108	150	120	166	116	161	...	...	...	108	150	...	...	...	...	...	...	...	...	...	...	...	...
9.	M.	10	128	128	100	140	109	110	109	136	106	88	69	88	69	88	69	...	...	...	...	...	...	...	...	...
10.	M.	20	120	112	93	112	93	112	93	112	93	116	96	112	93	96	80	104	90	104	90	...	...	...	...	...
Aver.	.	23.7	108	110	101	112	103	107	99	105	97	99	90	103	95	96	88	97	98	87	80	90	83	90	83	92	85

CHART II.—GAS REBREATHING.

SECONDS AFTER BEGINNING OF ADMINISTRATION.



The average systolic pressure before administration was 138 mm. mercury.

As our previous observations showed, the initial blood-pressure was unduly high. We now find that this is associated with an

unduly rapid pulse-rate, and consider that it is due to excitement. It is interesting to note that after 30 seconds the pulse-rate falls steadily but tends to remain higher than normal.

The fall in the pulse-rate is simply a return towards normal as the anæsthesia abolishes the emotional condition. It is not due to vagus action since the rate keeps above normal, and while the pulse-rate is falling there is a substantial rise in the blood-pressure.

The rise in the blood-pressure is due to constriction of the vessels. This is sometimes quite noticeable to the palpating finger, and there is no evidence that the heart beats more forcibly.

Comparing the two charts we note that when valves are employed the blood-pressure rises sooner, and remains at a high level for a longer time than when rebreathing is allowed.

There is no appreciable difference in the pulse-rate.

Nitrous Oxide (Rebreathing) Preceded by Oxygen.—The patient inhaled oxygen from a one-gallon bag fitted with valves, so that the lungs were washed out with oxygen. A two-gallon bag of nitrous oxide was then substituted and rebreathing of expired air was allowed.

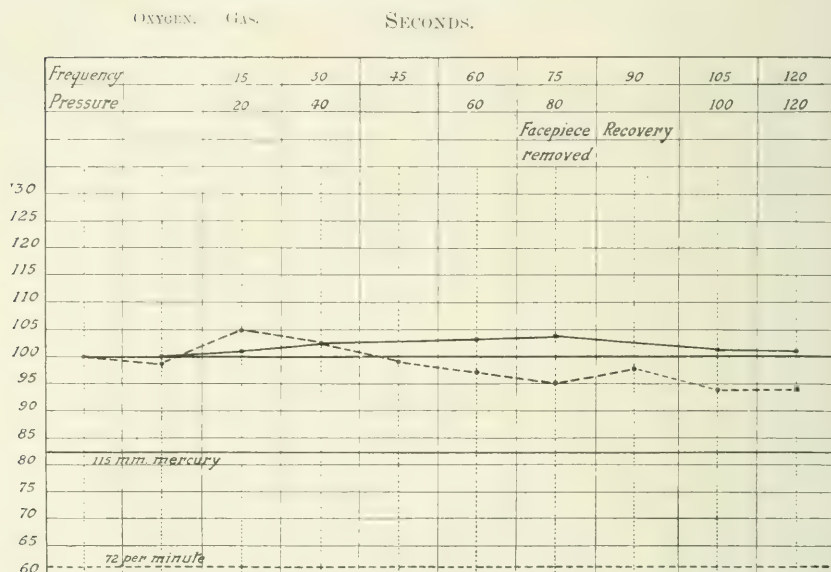
TABLE III.—OXYGEN AND GAS REBREATHING.

No.	Sex	Age	Initial Rate	SECONDS.																									
				O ₂	1	15	...	30	...	45	...	60	...	75	...	90	...	105	...	120	...	135	...	150	...	165	...	...	...
1.	F.	18	120	116	96	136	113	136	113	124	103	116	96	112	93	100	83	96	80	92	77	92	77						...
2.	M.	58	96	92	95	100	104	88	90	88	90	80	83	80	83	80	83	72	75	72	75	72	75						...
3.	F.	18	140	140	100	112	80	104	74	104	74	104	74			104	74	108	77	116	83	124	90						...
4.	M.	21	116	116	100	112	96	116	100	92	79	92	79	88	76			88	76		...	...							...
5.	F.	18	112	112	100	104	93	96	85	84	75	84	75	80	71			...											...
6.	F.	14	96	...		120	125	120	125	100	104	104	108	112	116	112	116	104	108	104	108	100	104	96	100	96	100		...
7.	F.	10	96	...		116	120	112	116	112	116	96	100	92	95	88	91	88	91	88	91	88	91						...
8.	M.	18	156	...		148	94	148	94	148	94	152	98	148	94	144	92	152	98	148	94	148	94						...
9.	M.	24	92	...		112	121	124	134	124	134	124	134	124	134	120	130	116	126	112	121								...
10.	F.	28	104	...		116	111	108	103	104	100	112	107	112	107	112	107	108	103	104	100	108	103						...
11.	F.	15	136	...		136	100	128	94	128	94	128	94	128	94	132	97	132	97	128	94	116	85	128	94	124	91		...
12.	F.	18	116	120	103	...				120	103	124	107	132	113	128	110	120	103	124	107	124	107	112	96				...
13.	M.	16	108	116	107	...		120	111	128	118	128	118	116	107	120	111	116	107	120	111								...
14.	M.	22	108	104	96	128	118	132	122	132	122	134	114	116	107	112	103	100	92	96	89			100	92				...
15.	F.	15	124	...		128	103	124	100	124	100	116	93	120	97	120	97	108	87	100	80	180	80	104	84				...
Aver.			105	115	114	99	121	105	118	102	114	99	112	97	110	95	113	98	108	94	108	94	107	93	108	94	...		...

We have already shown that the administration of oxygen previous to gas has a remarkable effect in diminishing the rise of pressure. Thus the maximum rise which ever occurred was 15 per cent., while the average maximum increase of blood-pressure was only 3 per cent. The pulse-rates show the same general tendency as those found when gas is given alone, but the changes are much less abrupt and less extensive.

There is always cyanosis when gas is administered with valves.

CHART III. OXYGEN AND GAS REBREATHING.



The systolic pressure before administration was 127.2 mm. mercury.

This is not nearly so marked a feature when rebreathing is allowed. It is altogether absent when oxygen is previously administered. These facts, together with the observations on the circulation, leave little room for doubt that the rise of blood-pressure is due to an asphyxial constriction of blood-vessels.

Gas and Ether.—Nitrous oxide alone was inhaled for 25 seconds; the ether dome was gradually rotated for from 25 to 50 seconds. A breath of air was allowed at 60 seconds and the face-piece was finally removed at from 90 to 120 seconds.

TABLE IV.—GAS AND ETHER.

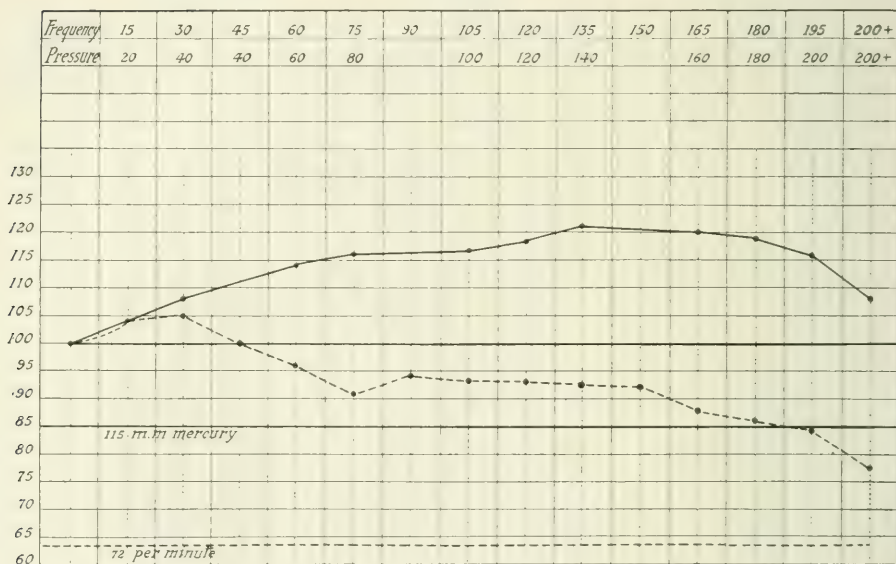
No.	Sex.	Age.	Initial Rate.	Seconds.															
				15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240
1.	F.	19	116	108	93	120	103	112	96	112	96	101	90	89	100	93	112	96	92
2.	F.	16	100	108	108	121	124	96	96	100	81	84	96	100	100	81	84	68	82
3.	F.	28	108	121	115	108	100	121	115	100	136	126	132	122	108	92	85	80	76
4.	F.	21	80	80	100	100	125	96	120	100	125	101	130	108	135	108	135	108	105
5.	F.	28	121	116	93	116	93	112	90	116	93	108	87	108	87	77	100	80	
6.	F.	22	111	132	106	111	100	111	100	111	160	111	100	118	103	118	103	110	63
7.	F.	28	121	120	97	128	103	116	93	88	71	72	58	101	120	97	112	90	68
8.	F.	33	108	121	115	120	111	100	100	100	93	86	76	70	80	74	100	92	85
9.	F.	30	110	111	103	140	100	132	94	136	97	132	94	132	94	121	89	120	83
10.	F.	30	96	104	108	104	108	96	100	84	87	60	62	60	62	61	66	61	91
Aver.	257	111	118	103	120	105	111	100	110	96	104	91	107	94	106	93	106	93	77

* Rate recorded is the slowest rate that the pulse reverted to after 200 seconds.

The striking feature in this series is a constant and nearly uniform rise of blood-pressure. It is not due to asphyxia, since it persists and may increase after the face-piece has been removed. Our former observations lead us to think that this rise might be due to stimulation of the heart as well as to vaso-constriction. In view of the fact that the pulse-rate falls steadily while the rise is taking place, it appears more likely to be entirely due to vaso-constriction, and since the asphyxial element can be excluded, it

CHART IV.—GAS AND ETHER.

SECONDS.



The average systolic pressure before administration was 135.2 mm. mercury.

may be inferred that the vaso-constriction is due to the action of the ether.

Ethyl Chloride.—Doses of 3 c.c. and 4 c.c. were administered and the results are stated separately. In our previous paper we gave the results on the blood-pressure of the administration of doses of 5 c.c., but in some of these the systolic pressure dropped to such an alarming extent that we consider such doses to be unjustifiable.

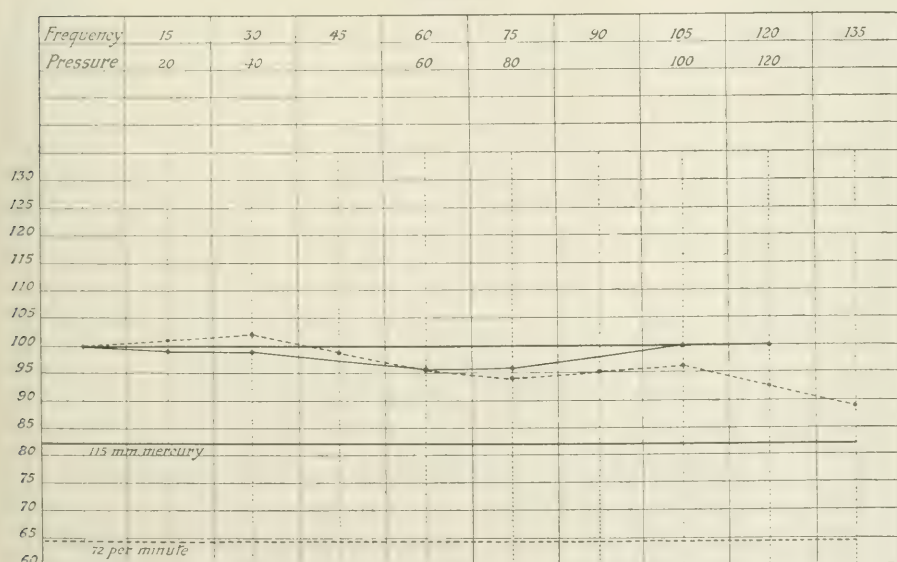
The face-piece was removed in about 45 seconds, so that the later figures refer to the period after administration.

TABLE V.—ETHYL CHLORIDE 3 C.C.

Sex.	Age.	Initial Rate.	SECONDS.																	
			15	...	30	...	45	...	60	...	75	...	90	...	105	...	120	...	135	...
F.	23	104	80	77	88	84	88	84	84	81	80	77	72	69	92	88	96	92	96	92
M.	12	104	108	103	108	103	104	100	104	100	96	92	100	96	...	...	100	96	96	92
M.	14	76	76	100	84	110	92	121	92	121	88	115	80	105	80	105	76	100	76	100
M.	43	124	112	90	108	87	104	84	100	80	100	80	...	...	96	77	96	77	104	84
F.	17	124	120	97	116	93	96	77	100	80	92	74	92	74	88	71	84	67	80	64
M.	18	72	96	133	88	124	88	124	...	...	88	124	...	...	80	111	84	116	92	127
F.	31	100	108	108	108	108	104	104	104	...	...	...	100	100	96	96	104	104	100	100
M.	26	128	112	87	120	93	120	93	112	87	108	84	112	87	112	87	108	84	...	...
F.	17	116	128	110	128	110	128	110	128	110	124	107	124	107	128	110	128	110	145	125
M.	21	144	160	111	160	111	148	102	132	91	...	...	136	94	136	94	132	91	...	...
F.	20	112	116	103	116	103	120	107	112	100	108	96	108	96	116	103	108	96	104	93
F.	24	76	76	100	76	100	80	105	80	105	...	...	92	121	84	110	...	...	...	...
F.	19	132	132	100	136	103	136	103	120	90	120	90	...	...	132	100	...	...	...	...
M.	21	136	148	109	140	103	124	91	120	88	132	97	128	93	...	...	116	85	...	...
F.	18	124	112	90	112	90	120	97	112	90	116	93	120	97	124	100	116	93	...	...
Mr.	21½	111	112	101	113	102	110	99	107	96	104	94	105	95	106	96	103	93	99	89

CHART V.—ETHYL CHLORIDE 3 C.C.

SECONDS.



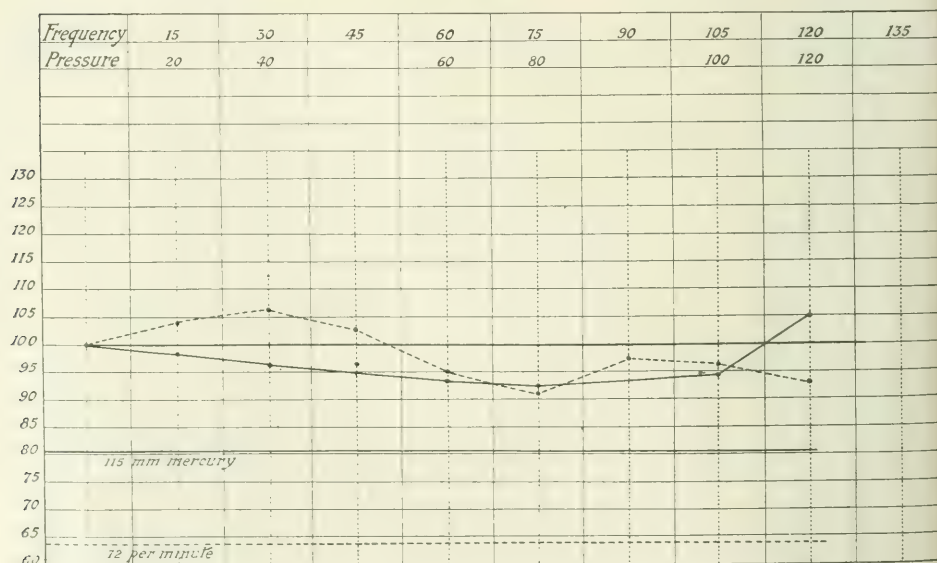
The average systolic pressure before administration was 127 mm. mercury.

TABLE VI.—ETHYL CHLORIDE 4 C.C.

No.	Sex.	Age.	Initial Rate.	SECONDS.																					
				15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300		
1.	M.	23	156	...	104	67	100	64	96	61	96	61	136	87	144	92	136	87	136	87	136	87	136	87	
2.	M.	20	100	120	120	120	92	92	100	100	112	112	...	...	116	116	116	116	...	...	...	...	...	...
3.	F.	30	136	140	103	152	111	140	103	...	...	...	132	97	120	88	120	88	...	...	...	...	...	...
4.	M.	24	112	80	71	100	89	100	89	88	78	96	85	100	89	76	67	68	61	68	61	68	61	80	71
5.	M.	24	96	108	112	...	...	116	120	128	133	100	104	96	100	100	104	100	104	...	...	108	112	...	...
6.	F.	22	124	136	109	144	116	144	116	100	81	80	64	76	61	72	58	72	58	80	64	100	81	108	87
7.	M.	19	112	128	114	136	121	140	125	120	167	100	89	128	114	120	107	112	100	100	89	116	103	...	...
8.	M.	18	120	124	103	120	100	120	100	112	93	104	86	108	90	104	86	116	96	...	...	...	...	...	...
9.	F.	28	136	152	112	152	112	152	112	118	109	140	103	136	100	136	100	140	103	144	106	...	...	...	...
10.	M.	19	88	108	122	100	113	104	118	100	113	96	109	100	113	100	113	...	...	...	...	...	...	...	...
11.	M.	20	100	104	104	112	112	92	92	...	...	100	100	100	100	108	108	104	104	100	100	...	...	...	...
12.	F.	20	108	112	103	112	103	124	114	128	118	120	111	120	111	116	107	96	89	...	...	...	...	...	...
13.	M.	26	88	116	131	116	131	96	109	88	160	92	104	100	113	100	113	100	113	...	...	...	...	...	...
14.	M.	19	100	104	104	104	88	88	88	88	88	92	92	96	96	100	100	...	...	...	...	...	...	...	...
15.	F.	31	124	120	96	112	90	124	100	116	93	116	93	124	100	124	100	...	...	...	...	...	...	...	...
Aver.	.	22.3	113	118	104	120	106	110	97	108	95	103	91	110	97	109	96	104	93	...	...	...	...	...	...

CHART VI.—ETHYL CHLORIDE 4 C.C.

SECONDS.



The average systolic pressure before administration was 128 mm. mercury.

The administration of 3 c.c. of ethyl chloride has a comparatively slight effect on the circulation. It is important to note, however, that it has a tendency to cause a fall in the systolic pressure. The changes are much more marked when larger doses are given. It must be noted, too, that the effect of averaging the results is to obscure the variations which take place when this drug is used. Thus at 60 seconds we note a fall in the pulse-rate to 61 per cent. in one case, and a rise to 133 per cent. in another. Again, during the course of administration we note in one case a fall in the actual pulse-rate from 128 at 60 seconds to 100 at 75 seconds. The outstanding fact is that a fall in blood-pressure takes place.

The explanation of this fall of pressure is not quite simple. The possibilities are that there may be vaso-dilatation, that the heart muscle or ganglia may be weakened directly, or that the heart may be weakened through the vagus.

There is no evidence of vaso-dilatation. Of the other possibilities a likely one is that the heart is inhibited through the vagus nerve. The only difficulty in the way of this view is the fact that the pulse-rate, though falling, tends to keep more rapid than normal. In all cases, however, this amounts to a considerable relative slowing. In some of the cases referred to in our previous paper in which doses of 5 c.c. were administered there was an actual slowing of the pulse. Then again it is shown that after 75 seconds have elapsed the pulse-rate undergoes a definite increase for no other apparent reason than removal of a depressing influence. It is not likely that weakening of the heart muscle would either supervene or pass off so quickly.

This view receives additional support from the next series of cases.

It must be admitted, on the other hand, that a serious fall in blood-pressure is caused by ethyl chloride in animals although the vagus nerves have been cut.

Gas and Ethyl Chloride.—After five inhalations of gas only, ethyl chloride is added to the gas bag and the resulting mixture along with the expired air is inhaled for 25 seconds. The dose of ethyl chloride was never more than 3 c.c.

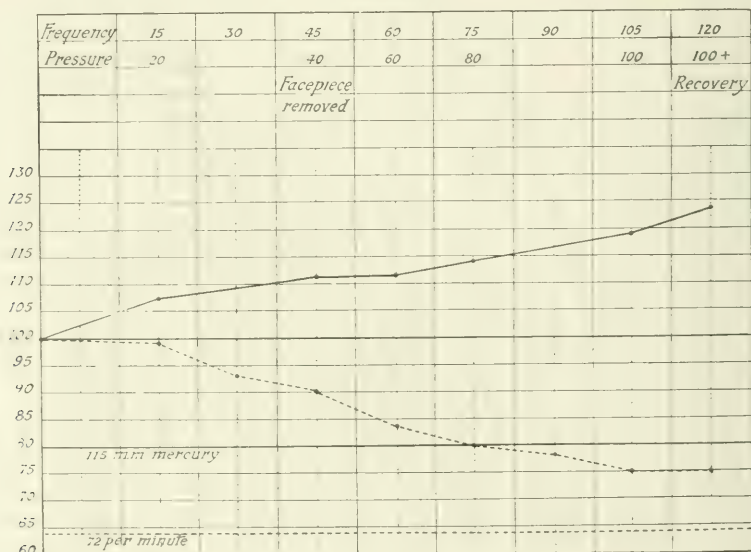
The previous administration of gas eliminates altogether the fall of systolic blood-pressure which occurs when ethyl chloride is given alone. The most simple explanation appears to be that gas diminishes the irritability of the vagus centre so that the ethyl chloride cannot affect it, but we have to admit that the case

TABLE VII.—GAS AND ETHYL CHLORIDE.

No.	Sex.	Age.	Initial Pulse-Rate per Minute.		RATE PER MINUTE DURING PERIODS OF FIFTEEN SECONDS.																											
					15	...	30	...	45	...	60	...	75	...	90	...	105	...	120	...	135	...	150	...	165	...	180	...				
1.	F.	27	140	140	100	140	100	136	97	108	77	116	83				104	75				
2.	M.	25	96	84	87	96	100	96	100	96	100	96	100				
3.	F.	14	132	104	78			104	78	96	72	84	63				84	63	80	60	88	66	92	70				
4.	F.	18	156	152	97	136	87	112	72	120	77	124	79	128	82	124	79				
5.	M.	21	124	108	88	116	93	100	80	100	80	...			76	61	80	64	80	64	168	55	64	52				
6.	M.	20	80	100	125	100	125	96	120	92	115	92	115	92	115	84	105	80	100	80	100				
7.	M.	38	84	88	103	88	103	96	116	84	100	84	100	84	100	84	100	80	95				
8.	F.	21	100	120	120	116	116	100	100	96	96	...	...					...	...	124	124	120	120	120	120	116	116
9.	M.	6	136	104	76	100	73	...	...	96	70	...	...				84	62	84	62	...	...	...	...	...	...	...
10.	F.	19	140	124	88	116	83	104	74	104	74	104	74	92	66	96	68	92	66	100	71	...	...	88	63	108	78			
11.	M.	20	120	116	97	112	93	116	97	104	87	...	...	92	82	80	67	80	67	80	67	84	70	88	73	80	67			
12.	M.	24	100	120	120	80	80	80	80	84	84	80	80	84	84	88	98	...	...	...	...	...	...	...	...	...	...
13.	M.	16	100	100	100	96	96	76	76	72	72	68	68	68	83	72	72		...	...	...	...	...	...	...	...	...
14.	M.	12	100	100	100	80	80	80	80	76	76	76	76	72	72	72	72	80	80	...	...	...	...	...	...	...	...
15.	F.	27	120	120	100	96	80	104	87	88	73	84	70	84	70	84	70	92	77	...	...	...	...	...	...	...	...
16.	F.	19	100	100	100	104	104	108	108	...		96	96	...	...	68	68	72	72	...	...	...	...	...	...	...	...
17.	F.	5	116	108	93	108	93	100	86	100	86	108	93			...	...	...	...	...	...	...	...	...	...	...	...
18.	M.	18	76	104	136	112	147	...	...	108	142	88	115	96	126	96	126	92	121	92	121	100	131	...	...	...	...	
19.	F.	25	140	116	83	100	71	100	71	104	74	96	69	100	77	100	71	96	69	...	...	...	...	...	...	...	...
20.	F.	23	80	84	105	84	105	80	100	68	85	60	75	68	85	68	85	68	85	...	...	...	...	...	...	...	...
Aver. .		20	112	110	99	103	93	100	90	94	84	91	81	88	78	84	75	84	75	94	84	95	85	91	81	92	82					

CHART VII.—GAS AND ETHYL CHLORIDE.

SECONDS.



The average systolic pressure before administration was 143 mm. mercury.

against the vagus is not proved. On this assumption, however, the rise of pressure which occurs is then easily accounted for by constriction of vessels, and since it is largely eliminated by the previous washing out of the lungs with a gallon of oxygen, the constriction is to be ascribed to the asphyxial element which is common to all closed methods. If the fall of pressure caused by ethyl chloride alone is not due to stimulation of the vagus centre, the explanation of the rise of pressure when gas and ethyl chloride are given must be very complex.

Summary.—1. In all cases, immediately before the administration of anaesthesia, the blood-pressure was found to be above normal and the pulse-rate was increased. This is accounted for by excitement stimulating the cardio-motor and vaso-motor centres.

TABLE VIII.—OXYGEN, GAS, AND ETHYL CHLORIDE.

No.	Sex.	Age.	Initial Rate.	SECONDS.																											
				Gas.		E. C.																									
				15		30	...	45	...	60		75	...	90	...	105	...	120	...	135	...	150		165	...	180					
1.	M.	24	112	132	117	128	113	116	103	104	93	88	78	88	78	92	82	88	78	84	75	84	75	84	75						
2.	F.	15	136	132	97	124	91	120	88	116	85	104	76	92	67	84	62	84	62	84	62	80	58	80	58	80	58	58			
3.	F.	16	84	100	119	84	100	84	100	80	95	76	90	76	90	72	85	72	85	72	85	72	85						
4.	F.	50	100	108	108	108	108	116	116	112	112	100	100	100	100	96	96			96	96	96	96	96	96	96					
5.	M.	18	120	132	110	136	113	132	110	112	93			108	90							112	93	104	86	104	86				
6.	F.	13	108	108	100	96	89	100	92	96	89	96	89	104	96	112	103	120	111	112	103	104	96	104	96	108	100				
7.	M.	19	88	92	104	...	...	92	104	...	...	100	113	100	113	100	113	100	113	96	109	92	104				
8.	F.	22	104	112	107	108	103	96	92	92	88			88	84	88	84			84	81	92	88								
9.	F.	18	112	124	110	124	110	100	89	96	85	100	89	100	89	104	93	112	100	120	110										
0.	F.	11	112	92	82	92	82	92	82	68	61	60	53	64	57	64	57	64	61	64	61	100	89								
1.	F.	18	144	144	100	136	94	128	89	128	89	112	78	96	67	96	67	92	63	96	67	112	89	128	89	128	89				
2.	M.	18	88	128	145	120	136	124	149	112	127	104	118	84	95	88	100	104	118	116	131	...									
3.	F.	10	88	108	122	116	131	124	140	112	127	108	122	108	122				84	95			112	127	100	113	100				
4.	F.	14	76	92	121	92	121	88	115	80	105	76	100	84	110	88	115	84	110	96					92	121					
5.	F.	32	140	120	85	128	91	128	91	120	85	124	88	120	85	124	88	116	83	124	88	120	85								
6.	M.	18	88	104	118	108	122	108	122	104	118	100	113	80	91	84	95	84	95	92	104										
7.	M.	20	136	148	109	144	105	124	91	160	73	112	82	124	91	112	82	120	88	120	88										
8.	M.	23	128	124	96	112	87	120	93	120	93	116	90	112	87	120	93	112	87	112	87	108	84	108	84						
9.	M.	24	84	84	100	84	100	92	109	92	109	92	109	94	113	100	119	80	95	76	90	80	95								
0.	F.	14	120	120	100	120	100	112	93	116	96	120	100	116	96	112	93	108	90	120	100	120	100								
ver.	.	20	108	115	106	113	104	110	101	103	95	99	91	97	89	96	88	95	88	98	90	99	91								

2. The blood-pressure rises considerably when gas is administered with valves. This is due to asphyxia, and the rise is not so marked when rebreathing is allowed. It is almost entirely eliminated when a gallon of oxygen is inhaled previously, but the period of available anaesthesia is curtailed by a few seconds.

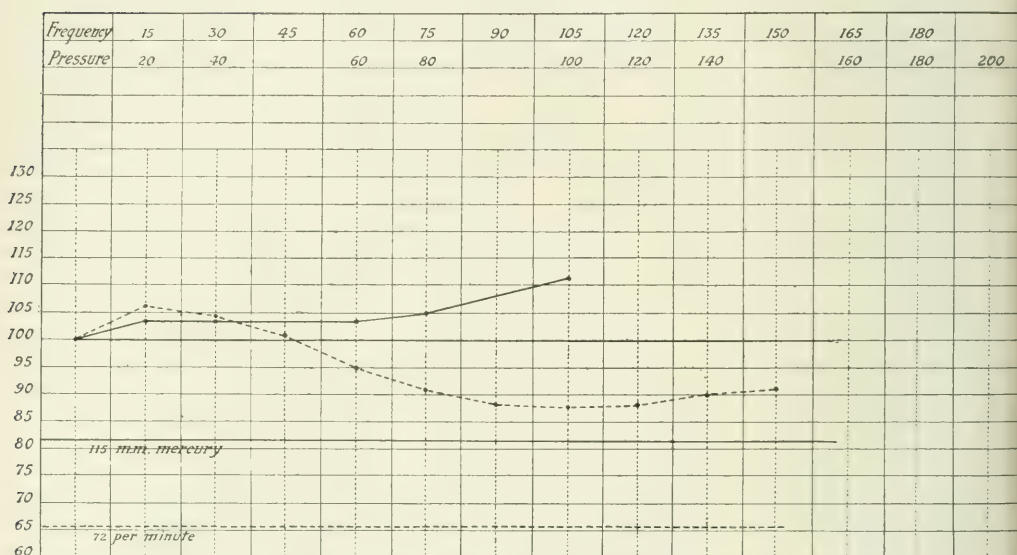
3. Nitrous oxide followed by ether causes a steady rise of pressure, due to constriction of vessels.

4. Ethyl chloride causes considerable disturbance of the circu-

CHART VIII.—OXYGEN, GAS AND ETHYL CHLORIDE.

Gas.

SECONDS.



The average systolic pressure before administration was 128.7 mm. mercury.

lation, and, in large doses, may bring about a dangerous fall of systolic blood-pressure. The pulse-rate tends to fall, but usually remains more rapid than normal.

5. If nitrous oxide be inhaled during five respirations before the ethyl chloride is administered, the blood-pressure rises.

6. The explanation of these facts is not simple. The vagus centre may be stimulated by ethyl chloride causing cardiac inhibition, but the continued rapidity of the pulse in most cases presents a difficulty in accepting this view. On the other hand, if the fall of pressure be due to weakening of the heart muscle

or ganglia, it is difficult to understand why the pressure should rise when the ethyl chloride is preceded by nitrous oxide.

7. The inhalation of a gallon of oxygen before the administration of gas and ethyl chloride greatly diminishes the pressor effect of gas and ethyl chloride alone, and this suggests that the pressor effect may be due, in part at least, to asphyxia.

HARVEY *v.* CÆSALPINUS; THE CONTROVERSY REOPENED.

FROM the historical standpoint above all others a text-book of physiology by an Italian professor cannot fail to be an interesting publication.

The first of four volumes of a work on Physiology by Professor Luciani, of the University of Rome, has just been issued in an English translation. It deals entirely with the circulation and respiration, and in a wholly admirable fashion.

Any account of the discovery of the circulation of the blood written by an Italian deserves our careful consideration, seeing that it was in Italy that so much was discovered that led up to Harvey's great generalisation, and that it was in an Italian city three years after Harvey's death that an Italian eye first saw the blood moving in the living capillaries.

The physiological anatomy of the vascular system had been for so long an object of study at the great medical University of Padua that the surprising thing is that the circulation of the blood was not discovered, and by an Italian, long before Harvey ever saw Padua. For we do not believe that it was so discovered in spite of Professor Luciani's learned attempt to prove once more that it was by Andreas Cæsalpinus, of Arezzo, who died in Rome in 1603. In his preface to the book Professor Langley, of Cambridge, is naturally not a little astonished to see the ancient controversy of Cæsalpinus *versus* Harvey reopened, and the Italian gain the credit of a discovery which, before Harvey died, almost all anatomists had assigned to him.

The junior student of biology knows that several important anatomical facts about the vascular system were discovered before Harvey was born, data from which the great fact of the circulation could have been deduced, but was not. Such are the existence of the four sets of intra-cardiac valves known to Erasistratus about 300 B.C., the so-called "lesser" or pulmonary circulation (Servetus, 1553; M. R. Columbus, 1559); the presence of valves in many veins (Vesalius, 1543; Canani, 1547; Fabricius, 1574); and the non-porosity of the intraventricular septum (Vesalius, 1543). Someone has said that from the structure of the heart and great vessels alone the circulation could have been inferred

at any time and without experiment; so it could, but it was not; a great many things that *can* be done at any time are not done at all.

Unquestionably *Casalpinus* understood the so-called pulmonary circulation perhaps more clearly than any of his predecessors. We say "so-called" because in itself it is no circulation; it is merely a transit of blood from the right side of the heart, *via* the lung vessels, to the left. Even *Galen* thought that some blood took this course, though most went through the septum. But whichever way it went, it is not in itself anything more than a passage or a progress from one place to another, analogous, as *Huxley* put it, to a man going into his neighbour's house either out at his own front door, into the street, and in by his neighbour's front door, or getting next door by boring a hole through the dividing wall.

All this was known before 1751, when *Casalpinus* published his *Questiones Peripateticæ*, but he did not generalise from the fact of the pulmonary transit, as *Harvey* did, to a knowledge of the circulation as a whole. For unless it can be proved that that very blood which leaves the aorta for the body returns in due time to the right heart to make again its transit of the lungs, we have not attained to a conception of a circulation, a returning to where we started. It was this *Harvey* did do, but no one before him did.

If *Casalpinus* knew so excellently all about the nonporosity of the septum, he had left plenty of anatomists unconvinced even as late as 1657, when *Harvey* had to explain laboriously to *P. M. Slegel*, of Hamburg, how he had done the crucial experiment of perfusing the heart of a recently hanged criminal.

Professor Luciani admits that *Casalpinus* did not use his knowledge of the valves of veins in conjunction with his knowledge of the cardiac valves to confirm him in his alleged discovery of the circulation. But this was precisely what *Harvey* did, for he insisted that the venous valves were always to prevent blood regurgitating to the periphery, and not to support a column of blood, as, *e.g.*, in the jugular veins where the concavities look down towards the heart.

It is perfectly true that *Casalpinus* did clearly teach that the blood went to the periphery by the arteries in consequence of ventricular systole, and, reaching the veins by "anastomoses," so passed to the heart. From these data, plus the pulmonary transit, the circulation is of course obvious to us, and it was so to *Harvey*,

but not made obvious as a necessary inference by Cæsalpinus. If he did discover the circulation, never was a fact of such magnitude so neglected as it was by his contemporaries.

Professor Luciani says Harvey did not realise the importance of what he wrote of: he realised it ten thousand times more than Cæsalpinus did. He says: "I tremble lest I have mankind at large for my enemies, so much doth want and custom become a second nature," so new is what he has to tell them, viz. "motion, as it were, in a circle" (chap. viii. *De Motu*).

Professor Luciani tells us that Cæsalpinus called the pulmonary transit "circulatio." It was a mere name so long as he did not show how the blood issuing from the aorta returned to the right auricle; but to this his supporters reply that he spoke of anastomoses and of "vasa in capillamenta resoluta."

Now whatever we understand by "capillamenta," it cannot be capillaries, which were not discovered until fifty-seven years after Cæsalpinus died. What he almost certainly meant by "vasa in capillamenta resoluta" was certain threads of connective tissue in which the arteries apparently ended when dissected to the uttermost, threads belonging to the sheaths of the vessels and to the neighbouring nerves.

Harvey, on the other hand, had a clearer notion that there were two kinds of peripheral communications between arteries and veins, viz. anastomoses, and something invisible which he describes in his letter to P. M. Slegel as "other and yet other channels and passages," showing that he did not merely imagine that the blood soaked through the tissues as through the pores of a sponge.

Harvey was perfectly certain that the communications were such as to abolish the pulse, which they would not do were they merely arteriovenous anastomoses. In the Slegel letter he says that if the communications were only anastomoses there would be "a pulse in the veins by reason of the continuity of parts"—really admirable physiology for 1651. Professor Luciani blames Harvey for not quoting Cæsalpinus, and indeed for ignoring his work. Now seeing that Harvey quotes a large number of ancient and contemporary writers, the natural inference is that he found nothing in Cæsalpinus of a helpful nature to quote.

Of course there is the other alternative that he did not know of his writings, though this is improbable; still, Cæsalpinus was not an anatomist but a botanist and naturalist. As Professor Luciani insists, Columbus had made the pulmonary transit so clear that

Cæsalpinus had nothing to add to it, and as Cæsalpinus had laid no particular stress on the venous valves, and thrown no more light on them functionally than had Fabricius, there was nothing in his writings to quote which could not be found better elsewhere. The following are all quoted in the *De Motu*:—Aristotle, Avicenna, Bauhin, Botallus, Columbus, Erasistratus, Fabricius, Fracastorius, Galen, Hippocrates, Hollerius, Andreas Laurentius, Riolan, and Jacobus Sylvius; and in the two letters to Riolan, the following are all quoted from:—Descartes, Fernelius, Heraclitus, Plato, Jacobus Sylvius, Vesalius, and Wakeus; so that it does not seem as though Harvey were purposely omitting anyone who had said anything bearing on his subject. The Italian theory, started long ago by Professor Ceradini, is that Harvey when at Padua had learned of the circulation from Cæsalpinus' writings, the last of which was published in Venice in 1593, and that he purposely delayed publication of it for twenty-five years after the death of Cæsalpinus. (The other suggestion, that he learned it from Fabricius, is gratuitous nonsense, as Fabricius was a pure Galenist.) But why should Harvey have been the only man to learn of the circulation from Cæsalpinus, for it is perfectly certain that Cæsalpinus did not contrive to instruct anyone in any new views about the movement of the blood, either in his lifetime or by his writings after his death? He founded no school, he raised no controversies, he encountered no resistance, he does not seem even to have offended any one of the admirers of Galen all round him—a very bloodless victory for a great discovery.

The fact is there seems to have been no contemporary recognition of Cæsalpinus as the discoverer of anything. Professor Luciani gives the names of five writers—Micanzio, Bartholin, Vesling, Gassendi, and Wakeus—who hailed Fra Paulo Sarpi as the discoverer of the circulation, but mentions only one writer, not an anatomist—Voss—who in 1685 gave the credit of it to Cæsalpinus. Isaac Voss (born 1618, died 1688) is no authority whatever on anything in physiology, and apparently never was in Italy. He was a classical scholar, but a credulous and erratic man, and for a time Professor of History at Amsterdam. On the other hand, it is well known that Harvey's name, even by his enemies, was associated with the discovery of the circulation—he founded a school, he was recognised as an anti-Galenist, a man of the new way in science, an experimenter. Leichner in 1646 called his essay, "*De motu sanguinis exercitatio anti-Harveciana*."

There was an anti-Harveian movement which extended to the laity, for on the publication of the *De Motu* Aubrey tells us Harvey's practice "fell off mightily," and he was thought "crack-brained." Learned Europe spoke of the "Harveian doctrine of the circulation." Harvey was attacked by Riolan, Primerose, Parisanus, Vesling, Caspar Hofmann, Plempius, and many others.

Parisanus, Primerose, and Plempius were not worth replying to; they merely reiterated Galenism; but the others Harvey took a great deal of trouble to convince. Before his death his "doctrine" had been accepted by Descartes, Wakeus of Leyden, Leroy of Utrecht, Slegel of Hamburg, Wolfink of Jena, Trullius of Rome, Bartholin of Copenhagen, and Pecquet of Dieppe.

Hobbes, a contemporary, wrote that Harvey founded the "true science of the human body," and described him as "the only man I know that, conquering envy, hath established a new doctrine in his lifetime." Descartes' allusion is almost too well known to quote again—"As to the circulation of the blood, there he has his triumph and the honour of first discovering it, for which medicine owes him much;" and again he speaks of Harvey as "the English physician to whom belongs the honour of having first shown that the course of the blood in the body is nothing less than a kind of perpetual movement in a circle." Descartes' opinion is a little worthier of respect than Voss's, for Descartes dissected many animal forms and studied physiology with considerable application. We pass over all subsequent recognition of Harvey, as for instance that by Haller, who is generally supposed to have decided wholly in his favour and against Cesalpinus. If, as Professor Luciani tells us, Thomas Bartholin hailed Sarpi as the discoverer of the circulation, he was highly inconsistent, for he wrote of Harvey—"to have the glory of discovering the movements of the heart and blood was enough for one man."

It is a little hard on Harvey to blame him, as Professor Luciani does, for not fully grasping the physiological and therapeutic consequences of his great discovery. It is so easy for us to-day to deduce all that the circulation means, but we have to remember the physiological atmosphere of Harvey was black with Galenical darkness and poisonous with the miasmata of the schools.

Harvey was the giant who spent all his energies in letting in the new light so that he had no leisure left to take a calm survey of everything that that light revealed. He certainly, however, understood how the doctrine of the circulation explained the systemic distribution of a locally absorbed poison.

We strongly suspect that this question of Cæsalpinus and Harvey is not altogether one of historical and academic import; the element of national pride cannot be dissociated from it, for anyone will do so long as he is an Italian. Thus Professor Ercolani has erected a tablet in the Veterinary School at Bologna, stating that Ruini was the discoverer of the circulation of the blood.

The following letter from Professor Filippo Pacini to Dr. George Johnstone, published in the *Lancet* of 14th October 1882, lets the racial cat out of the controversial bag:—"I am bound to acknowledge that the glory of having demonstrated that discovery by every kind of argument and of fact belongs unquestionably to Harvey.

"If Cæsalpinus and Harvey were now living, it is certain that our scientists would consider it a duty to attribute it to Harvey; but both being dead, it is natural that Italian scientists should attempt to claim it for Cæsalpinus, and thus it is that Italy is still called 'The Land of the Dead.'"

Yes, it is natural and patriotic, but is it just or scientific?

D. FRASER HARRIS.

CLINICAL RECORD.

ENLARGED PROSTATE ASSOCIATED WITH VESICAL TUMOUR. NOTES OF SIX CASES.

By DAVID WALLACE, C.M.G., F.R.C.S.,
Surgeon, Royal Infirmary, Edinburgh.

As operative experience increases in cases of enlarged prostate, liability to error in diagnosis based on symptoms alone is necessarily more recognised. The fallacy of fibrous stenosis at the neck of the bladder as a cause of prostatism is now admitted, and the need for care in differentiating simple enlargement from malignant disease of the prostate is well known. Within the last two years I have seen six cases of enlargement of the prostate associated with the presence of a vesical neoplasm, in each of which the symptoms were explicable from the enlargement of the prostate without any suggestion of the presence of a tumour, and it is to this possible association that I wish to direct attention. In all of these cases hæmaturia was a prominent symptom, but this did not necessarily indicate the presence of a tumour, as it is quite well known that profuse bleeding may be due to prostatic enlargement alone, this symptom of bleeding not infrequently being the first symptom seriously to direct a patient's thoughts to his condition, so that he consults his medical attendant. More especially is this the case when clots are passed and difficulty in micturition results, leading, it may be, to temporary retention. If a patient comes before us with a history of bleeding and he is well up in years, describes symptoms such as we are familiar with in prostatic cases, and we find on examination *per rectum* that the prostate is enlarged, it seems natural to take the simple explanation and diagnose hæmaturia a result of prostatic enlargement. In such a case as a routine we examine the kidneys by palpation, but unless we have definite evidence of something wrong, we are almost justified in believing that the prostate is the cause. We do not consider that it is necessarily a malign prostate, because we are more likely to have profuse bleeding in a simple case than in neoplasm of the prostate. At the present time prostatectomy is so often recommended, and its results are so beneficial in the majority of cases, that we are most likely, having made the diagnosis of enlarged prostate, to advise operation and give a very favourable prognosis. If, how-

ever, at the operation a vesical tumour is found, it must be very disconcerting to the surgeon and most disappointing to the patient. On the other hand, if the symptoms are not urgent and the bleeding not profuse, operation may be delayed, palliative measures adopted, and valuable time is lost. As an example of this I quote the following case:—

G. D., æt. 70, in April 1909 complained that he had to rise three or four times at night, and that for three weeks he had seen some blood in his urine. It came at the beginning, and the urine towards the end was clear. He had no pain in the lumbar regions and the kidneys were not palpable. *Per rectum* the prostate was not much enlarged, and there was no induration. He stated that the first bleeding was seven years previous to the present attack and lasted eight days. Since then bleeding had occurred three or four times and lasted for a day or two. I advised no operation, and wrote to his doctor that I thought the condition was prostatic, but that if the bleeding continued he should be examined cystoscopically. In October 1910, that is about eighteen months later, he came to see me again. The bleeding had ceased for nearly a year and then recurred. The frequency of micturition was as before, but he now stated that he had lost weight. Examination *per rectum* revealed practically no change. I examined him cystoscopically and detected a villous tumour just above the left ureteral orifice. I later removed this tumour and the patient made an excellent recovery.

One naturally asks the question in regard to the above case, Should an earlier diagnosis have been made of vesical growth? and I am satisfied that a similar history of bleeding in a man of about 50 would have at once suggested a vesical neoplasm; but in a man of 70 the symptoms were rather those of enlarged prostate, and had he had greater micturitory trouble I would probably at the first have advised prostatectomy without the use of the cystoscope as an aid to diagnosis.

Take another case—Mr. A., æt. 69. I need not detail the symptoms further than to say he had frequency of micturition and at the time I saw him hæmaturia, the former of some years' duration, the latter, of much more recent origin, three months. The prostate was enlarged, firm, and rather fixed, so much so that I feared it might be malign, and it was certainly not a satisfactory one for removal. Again I attributed the symptoms to prostatic enlargement, with the *carcat* that the prostate might be malignant.

I advised no operation, but said that if the symptoms got worse, or the bleeding increased, a cystoscopic examination should be done with a view to immediate operation if that proved feasible. In six months, his symptoms being worse and the bleeding more continuous and profuse, I made a cystoscopic examination, which revealed a large sessile papilloma, involving the bladder-wall so widely that removal was out of the question. I performed a suprapubic cystostomy, and he wore a tube for some months with much comfort.

In this case, again, if the patient had been a younger man I think the diagnosis of vesical tumour would have been arrived at from the symptoms, but at the patient's age these were quite explicable on the ground of an enlarged prostate, and a provisional diagnosis was made on that basis.

The other four patients were all over 65 years of age, and the symptoms in each were those of hæmaturia associated with prostatic enlargement rather than caused by bladder tumours. In only one was there pain accompanying the bleeding, and in his case another surgeon had sounded him for stone three years previously, and failing to detect a stone pronounced the condition to be due to enlarged prostate. The bleeding ceased for months, but the frequency of micturition continued to give trouble, both during the day and at night. I saw him when the bleeding had continued for several months, and concluded that the condition was due to a tumour. This I verified by cystoscopy, when I detected a large villous growth. A palliative suprapubic cystostomy was performed, and the bleeding entirely ceased.

The conclusion of the matter may be summed up as follows:—

Hæmaturia is a symptom of prostatic enlargement and also of vesical tumour, and in a man with enlarged prostate it is often not possible to say it is due to the one rather than to the other. Short of operation there is only one means of diagnosis, and that is by cystoscopy.

When we have much bleeding, or when bleeding comes on without any aggravation of other symptoms in a case of enlarged prostate, no instrumentation having been used, it should be borne in mind that a neoplasm may be the cause. In such circumstances it is judicious to make a cystoscopic examination prior to opening the bladder. In some cases it may not be possible to pass the cystoscope, and then we must operate, but in such a guarded prognosis should invariably be given.

MEETINGS OF SOCIETIES.

Edinburgh Medico-Chirurgical Society.

A MEETING was held on 5th July, Dr. Byrom Bramwell, President, in the chair.

Dr. Chalmers Watson showed a man, aged 41, suffering from myasthenia gravis.

Dr. Lovell Gulland showed a case of locomotor ataxia treated with salvarsan. Before treatment the patient had to be supported into the ward; after treatment there was a subjective sense of well-being, the patient was able to walk unaided, and Romberg's symptom, previously very marked, had become much less severe.

Mr. Cathcart showed a woman, aged 40, who had suffered for months from pain, vomiting and jaundice. Several gall-stones were found in the gall-bladder but none in the common duct. A cyst was found in the head of the pancreas. The gall-bladder and cyst were drained through the abdominal wound, and symptoms disappeared.

Dr. Halliday Croom (for Dr. Gibson) showed (1) a man, aged 41, suffering from patent arterial duct associated with aortic disease; (2) a patient who suffered from purpura, with a history of syphilitic infection five years previously. A fusiform dilatation of the aorta was also found. An injection of salvarsan had been followed by a very severe reaction and a left-sided hemiplegia.

Mr. Cathcart showed a specimen of malignant tumour of the kidney, which had extended along the renal vein into the inferior vena cava, and completely blocked it up to the diaphragm.

Dr. Eason showed the lungs from a boy who had suffered from tuberculous broncho-pneumonia of both lungs and right pneumo-thorax. A basal cavity had ruptured into the pleural sac.

Drs. Gulland and Goodall communicated a paper on a "Case of Lymphadenoma Treated with Salvarsan." Patient was a man, aged 25, who had suffered for nearly two years from enlarged glands of the neck. X-rays revealed a mass in the mediastinum. Spleen and liver were not much enlarged. The blood showed a polymorph leucocytosis which increased with exacerbations of temperature. Arsenic subcutaneously and other remedies were used without benefit. An injection of salvarsan into the buttock had little effect. Ten days later an intravenous injection was followed by great benefit. There was a marked reaction, after which an impending attack of fever was cut short, the glands diminished greatly in size, and subjective symptoms disappeared. Improvement persisted for a month, and patient left hospital. Febrile attacks recurred and the glands enlarged again. Further treatment with salvarsan failed to arrest the further progress

of the disease, and the patient died. Post-mortem appearances were typical. The bone marrow showed a remarkable degree of punctate basophilic degeneration in the red cells of the bone marrow. It was an interesting question whether this change which the authors regard as toxic was due to the disease or to the salvarsan.

The President remarked on the interest of the case in view of the fact that arsenic was the only drug that was known to do good in lymphadenoma. Treatment with salvarsan at an earlier stage of the disease might be of great benefit.

A discussion took place on the upper air-passages as avenues of general infection.

Scottish Otological and Laryngological Society.

THE second meeting was held in the Western Infirmary, Glasgow, on Saturday, 20th May, under the chairmanship of Dr. Thomas Barr.

Dr. Thomas Barr showed a patient who, twenty-four years ago, came under his care suffering from otitic temporo-sphenoidal abscess. Sir William Macewen operated. It was fully reported in the *Lancet*, 20th March 1887, and is of historic interest as being one of the first of its kind operated on, Barker's and Caird's cases preceding it by only two or three months.

Dr. Walker Downie showed a man from whom he had removed a large subglottic papilloma by thyrotomy. This method was adopted in preference to the direct, because of the foul appearance of the growth and because of loss of movement of the cord. The larynx was immediately closed. At the present time the cord moves well, but it is still congested, and in spite of the pathologist's report, simple warty papilloma. Dr. Logan Turner voiced the opinion of other members in considering it a case which should be carefully watched for signs of malignancy.

Dr. Downie reported a case of bilateral abductor paralysis of the cords in which it was found necessary to perform tracheotomy to prevent suffocation. A most careful examination failed to disclose the cause of the paralysis. With reference to Semon's law Dr. Fraser inquired if any member had ever watched a case in which abductor paralysis had gone on to complete paralysis, leaving the cord in the cadaveric position. Only one member, Dr. Downie, was able to report such a case. This man, a singer, was under the care of the late Dr. Finlayson for a lengthened period. At first he was found to be suffering from unilateral abductor paralysis. He could sing quite well, and indeed made his living in that way. Later, however, he lost his voice, and on examination the cord was then seen to be lying in the cadaveric position.

Dr. Downie also showed—(1) A patient nine years after the injec-

tion of molten paraffin to remedy deformity of the nose. The paraffin remains inert, does not tend to migrate nor to become absorbed, and the improvement effected is permanent. (2) A patient from whom a large nasopharyngeal fibroma had been removed by the *écraseur* through the nose. (3) A woman with a congenitally short palate. Speech is defective but deglutition is unimpaired. (4) A patient operated on on several occasions, the last being fifteen months ago by intra-nasal methods for sarcoma of the ethmoid.

Dr. J. Stoddart Barr reported a fatal case of cerebellar abscess, and also showed a patient successfully operated on for the same condition, both the result of chronic middle ear suppuration. In the fatal case the abscess was associated with infective panlabyrinthitis and with septic thrombosis of the lateral sinus; indeed there was an opening in the sinus wall leading into the abscess cavity. Operation was carried out on the labyrinth, the cerebellum, the sinus, and the internal jugular vein, but death occurred from purulent leptomeningitis. In the other case there was no labyrinthine involvement. There was, however, a subdural collection of pus, which was at first dealt with. Later the cerebellar abscess was discovered and drained. From this mixed staphylococci grew on culture, and a vaccine was prepared and used in increasing doses every eight days. Uninterrupted recovery resulted. Dr. Stoddart Barr also showed a patient on whom he had operated by intra-nasal methods two years ago for carcinoma involving the left ethmoidal region.

Dr. James Adam showed—(1) Two patients, a man and a woman, in whom an atrophic rhinitis had commenced in adult life. The latter of these patients had been under his care for another condition for some years, and he was therefore able, from his own observations, to confirm the history. (2) A patient who had suffered from chronic oedema of the face, associated with maxillary antral disease and extensive dental caries. Attention to these conditions combined with vaccine treatment resulted in great improvement. (3) A girl in whom radical mastoid operation for chronic middle ear suppuration was followed by greatly improved hearing. (4) A patient operated on for polypi arising from the inferior turbinal.

Dr. A. Brown Kelly showed a woman, aged 21, suffering from syringobulbia, with implication of the nose, pharynx, and larynx. When she first came under observation she complained of hoarseness, intermittent for several years and constant for fourteen months, and loss of power in right arm. She had occasionally burnt her right hand without being aware of it till blistering had taken place. At the present time her condition is as follows:—There is anaesthesia of the lining membrane of the right nasal fossa except above the posterior end of the middle turbinate, of the right half of the soft and hard palate, of the right half of the posterior pharyngeal wall, and of the right half

of the larynx. The left half of these parts is only very slightly affected. Both conjunctivæ are insensitive. There is loss of abduction of the cords, and adduction is incomplete. The palate is drawn up to the left on phonation, but does not reach the posterior pharyngeal wall. There is atrophy of the right half of the tongue, which, however, is normally protruded. The right masseter is paralysed. Other points are—nystagmus on lateral and upward movements of the eyes, knee-jerks normal, tactile sensation absent over right side of neck and lower jaw and down over shoulder to level of nipple, over right arm except on inner side from axilla to elbow; it is blunted and delayed on left leg. Pain is diminished on both sides of face and scalp, especially on right side, on arms and legs, and on trunk above nipples. The appreciation of heat and cold is doubtful on upper part of trunk; and on face, arms, and neck it is perverted. Dr. Kelly also showed a boy, aged 13, suffering from myasthenia gravis with impaired speech. This was first noticed a year ago, and lately it has become much worse. On phonation the palate is only slightly raised, but it responds completely to probing. The tongue is protruded perfectly. His speech resembles that of a person partially intoxicated, and the defect appears to be in the muscles of articulation. There is no rhinolalia aperta and no regurgitation by the nose during deglutition. On electrical stimulation the muscles round the mouth give the myasthenic reaction but those of the palate do not. Dr. Kelly wished to acknowledge the kind co-operation of Dr. John Love in these two cases. In connection with the boy, Dr. Turner drew attention to his age, remarking that it was probably one of the youngest cases of the kind reported.

Dr. Kerr Love showed a girl, 8 years of age, on whom he had operated for lateral sinus thrombosis secondary to chronic middle ear suppuration. The sinus was occupied by septic clot from the jugular bulb almost to the torcular. The internal jugular vein was tied and the sinus evacuated, and the child made a steady though slow recovery.

Dr. J. Galbraith Connal showed a somewhat similar case. In this patient, however, the sinus complication was secondary to acute middle ear suppuration, which was present on both sides, so that it was somewhat difficult at first to decide which lateral sinus had become involved. More definite signs later pointed to the left sinus, which was found grey and sloughy in appearance and to be thrombosed in the region of the bulb. It was dealt with, and two days later the jugular was tied and divided. Three weeks later it was found necessary to open the mastoid cells on the right side. The patient made a good recovery, with normal hearing on both sides. Dr. Connal also showed a patient from whose right external auditory meatus he had removed a large exostosis which completely blocked the channel. It was then seen that the patient had a chronic middle ear suppuration of which he had

been unaware, the tympanum being filled with foul-smelling cheesy material. Later the radical mastoid procedure was carried out. With reference to the causation of these growths, Dr. Connal remarked that a history of frequent and inordinate bathing could usually be elicited. (This patient lived by the sea and bathed as many as six times a day during the summer months.) They were more often found unassociated with middle ear suppuration.

Dr. Fullerton showed a girl on whom he had performed Killian's operation for frontal sinus disease. It appeared that the intersinusal septum was destroyed, but no opening could be found from what seemed to be the left sinus into the nose. Probably the true state of matters was that the right sinus encroached to an unusual extent on the left, which was so small as to be almost non-existent.

Other patients operated on for frontal sinus disease were shown by Drs. Downie, Stoddart Barr, and Syme.

Dr. W. S. Syme showed a patient, a woman, with anaesthesia of the palate, pharynx and larynx, and paresis of the palate. When first seen four months ago the anaesthesia of the palate, pharynx, and root of tongue was fairly well marked. This had improved, but the larynx remains decidedly anaesthetic. Occasionally she has regurgitation of fluids through the nose, and sometimes particles of food pass into the windpipe. Vertigo with tendency to fall to the left has lately developed, and her sight has deteriorated. There is optic neuritis. No history of syphilis can be elicited. The knee-jerks are much exaggerated. There is nystagmus towards the right, increased on deviation to that side but absent on deviation to the left. The ears and the hearing are practically normal. The caloric reactions are interesting. Cold water in the left ear quickly produces a very marked coarse nystagmus towards the right, with severe vertigo and tendency to fall to the left. With the right ear the reaction is much less marked and practically no sense of vertigo is caused. The patient has also been seen by Dr. Stockman, and a provisional diagnosis of cerebellar tumour has been made. Dr. Syme also showed a man on whom he had performed an external operation, together with obliteration of the frontal sinuses, for extensive sarcoma of the nose.

There was an interesting exhibition of pathological specimens, skulls, photographs, &c., by several members.

The members afterwards dined together at the Grosvenor Restaurant. Several guests were also present.

Edinburgh Obstetrical Society.

THE seventh meeting of the session was held on 14th June, Dr. Haultain, President, in the chair.

Specimens were shown by Professor Kynoch, Dr. Haig Ferguson, and Dr. B. P. Watson.

Professor Kynoch read a "Note on a Chylous Mesenteric Cyst, Simulating a Pelvic Tumour."

Tumours between the layers of the mesentery might originate in the connective tissue, fat, lymphatic vessels and glands, unstriped muscle of the region, or from the congenital remnants of the Müllerian and Wolffian ducts. The cystic varieties might be (1) serous, (2) chylous, (3) hydatid, (4) blood cysts, (5) dermoid, (6) cystic sarcoma. Professor Kynoch's case was of the chylous type, a condition first accurately described by Hahn of Berlin. They had been described as arising from dilated lacteals or degenerated lymph-glands, and might be unilocular or multilocular, sessile or pedunculated. Rasch claimed to have reported the first case in a woman in London in 1887. They were said to be more common in women than in men, and occurred at any age, and varied greatly in size. The most important physical signs were—(1) The most prominent part of the tumour was near the umbilicus; (2) extreme mobility; (3) a note of resonance all round the tumour on percussion, with very frequently a resonant band crossing the swelling. Clinically the outstanding symptoms were pain over the tumour, intestinal disturbances usually towards constipation, sometimes vomiting and persistent diarrhoea, and general wasting.

The author's case was a woman of 37. She complained of pain in the left lower part of the abdomen, where she had noticed an increasing swelling for three years. Menstruation had continued to be regular, with increase of pain at these times. She had been $7\frac{1}{2}$ years married and had three children; labours uncomplicated; no miscarriages. Her general health was good except for occasional attacks of diarrhoea and vomiting.

On examination a well-developed tense tumour was felt in the hypogastric region, nodulated, and extending from the left iliac fossa across the middle line for about an inch to the right side of the umbilicus. Its mobility, especially from side to side, was very marked. There was dulness on percussion all over the tumour, with a resonant note surrounding two-thirds of the swelling.

On per vaginam examination a cystic swelling the size of a lemon was felt in the right fornix. The left ovary was not palpable and the uterus was somewhat enlarged. Pressure downwards of the tumour seemed to indicate that it was intimately connected with the uterus and led to a diagnosis of left ovarian tumour or subserous fibroid.

On opening the abdomen an ordinary right-sided multilocular

ovarian cyst was removed. The uterus and left ovary were normal. The abdominal tumour was found to be situated between the layers of the mesentery of the lower part of the ileum. A small incision showed the contents to have a milky appearance. On further examination this was found to have all the physical and chemical characters of chyle. The peritoneum over the centre of the tumour having been incised, the cyst, the size of a child's head, was enucleated. The divided edges of the peritoneum were sutured and a glass drainage-tube inserted. The patient made a satisfactory recovery. On microscopic examination the cyst wall showed connective tissue with sparse muscular fibres; there was no evidence of any epithelial or endothelial lining.

In diagnosing mesenteric from pelvic tumours it had been suggested to use an exaggerated Trendelenburg position, in order to allow the falling away of the cyst from the pelvis, and to permit of an inferior zone of resonance being made out.

The paper was discussed by the President, Dr. Haig Ferguson, and Dr. Ballantyne.

Dr. John McGibbon read a paper on "Repeated Cæsarean Section for Contracted Pelvis, with Notes of a Case Successfully Performed for the Third Time on the Same Woman."

There were some points regarding repeated section which merited discussion and criticism, and within the past year the subject had been brought up for discussion at several of the important obstetrical societies of Europe and America.

Routh, in a paper read before an International Congress of Obstetrics held at St. Petersburg last September, pointed out that the teaching of Mauriceau of Paris must have greatly influenced British obstetricians, and that his condemnation of Cæsarean section had apparently the effect of holding the British operators of the day in check, for from the translation of his treatise in 1752 until 1821 only a few Cæsarean sections were performed, and all with one exception ended fatally.

The conservative operation from 1821 still struggled on until 1876, with a mortality of about 90 per cent., but it was then that Porro introduced his method of supravaginal hysterectomy with extra-peritoneal treatment of the stump, which seemed as though it were going to replace the conservative Cæsarean section.

In 1888 some successful conservative sections were reported, and from this time onwards the conservative operation regained favour and the mortality steadily diminished. Thus in 1890 it had fallen to 38 per cent., and ten years later to 20 per cent.; to-day the mortality of Cæsarean section when performed before labour was 2·9 per cent.

The patient whose case was the subject of this paper had Cæsarean section performed three times. Her first labour had to be terminated by craniotomy. She had a generally contracted pelvis with a true conjugate of from 3 to 3¼ ins. The third operation revealed only

a fine linear depression as the trace of the previous scar. There was *no* thinning of the uterine wall in the scar region, and, contrary to the experience of many, there were no adhesions.

When compared with premature labour as the operation of election, Cesarean section in such a case had distinct advantages. The fetal mortality of induced labour in a pelvis of 3 or $3\frac{1}{4}$ ins. was stated by some authorities to be not less than 10 per cent. In the writer's own hands, in a series of cases induced in successive pregnancies, the fetal mortality had been practically nil, provided the labour ended spontaneously. When, however, after the induction the head stuck and forceps seemed indicated, he had had a fetal mortality of nearly 50 per cent. If at the thirty-fourth week the head could not be pushed through the brim, the chances of a spontaneous delivery after an induction, with survival of the child, became most uncertain, and here Cesarean section became the operation of choice. In the performance of the classical Cesarean section various incisions were proposed and practised, but the transverse fundal and the median longitudinal on the anterior wall were the only two much employed in this country.

In recent years attempts by Frank, Gellheim, and others to perform an extra-peritoneal Cesarean section had been carried out, the original aim of such being to empty the uterus in infected cases without contaminating the peritoneal cavity. Such methods, however, of extra-peritoneal Cesarean section had been disappointing, as they had been associated with various injuries to peritoneum and bladder and had a *morbidity* of about 30 per cent. For infected cases the suggestion of Gellheim to produce a utero-abdominal fistula ought to be remembered.

The difficulty in the past had undoubtedly been with the doubtfully infective cases, but there seemed hope from recent bacteriological investigation that intra-uterine swabbings might identify the presence of pathogenic organisms, and so indicate the course to be followed. We could not yet make a clean sweep of craniotomy. It was indicated in cases believed to be infected where Cesarean section became risky, and showed a much smaller mortality. The question of adhesions had always been a source of anxiety to the operator in repeated sections. Adhesions between the uterus and the abdominal wall took place by accident in some cases. Wallace of Liverpool intentionally fixed the uterus to the abdominal wall with the object of being able to perform a future section without entering the peritoneal cavity. This procedure had been condemned by some as predisposing to rupture. The relation of repeated section to rupture was important. Mason and Williams, from experiments on animals, had concluded that a carefully united uterine scar would stand any strain which the uterine muscle was capable of enduring, and they maintained that rupture was dependent upon imperfect consolidation. It was an established fact that the mortality of repeated Cesarean section was rather less than that of the

primary operation, and it was not the duty of the surgeon to advocate sterilisation. It was his duty to lay the possible risks before every woman who came to him desiring a living child by Cesarean section repeated, but having done so it was also his duty to perform the operation on a third, fourth, or further occasion if requested by the patient to do so.

Dr. Berry Hart, Professor Kynoch, Dr. Haig Ferguson, Dr. Ballantyne, Dr. Fordyce, Dr. Lackie, and the President made remarks.

RECENT LITERATURE.

CRITICAL SUMMARIES AND ABSTRACTS.

MEDICINE.

By EDWIN MATTHEW, M.A., M.D., F.R.C.P.,
Assistant Physician, Royal Infirmary.

CASES OF PICK'S SYNDROME.

CORNWALL (*New York Medical Journal*, May 1911) reports a case of Pick's syndrome. The signs and symptoms of this syndrome are enlargement of the liver with obstinately recurring ascites, but without jaundice and without any signs of interference with the functional activity of the liver. Cases with these symptoms are not uncommon and are of extreme interest, both because they are often described as and mistaken for hypertrophic cirrhosis of the liver, and because of their etiological relationship to antecedent pericarditis. Hypertrophic cirrhosis of the liver, however, can be excluded (1) from the absence of jaundice, and (2) because in this disease the condition is well advanced before tapping becomes necessary, and the patient rarely lives long enough to require a second tapping. Pick in 1896 was the first to point out the distinctive nature of these cases and to suggest their relationship to pericarditis, and since then several other cases have been described. Cornwall's case was typical. A boy of 19 had an attack of typhoid fever followed by a relapse. During the relapse he developed dry pericarditis. His condition remained critical for several weeks, due to myocardial weakness, and it was only after three months that he was able to get out of bed. For some months he remained well, but enlargement of the abdomen then set in. The liver was considerably enlarged, and there was a large amount of fluid in the abdomen. He was put to bed, put on restricted diet, and given diuretics. The ascites continued to increase and tapping had to be resorted to. The fluid rapidly reaccumulated, and in a fortnight again a large quantity of clear fluid had to be drawn off. Subsequently the patient had to be tapped at varying intervals of between a fort-

night and three weeks. His general condition all the time remained good, and at the time of record the enlargement of the liver remains, and he still is being tapped. The interest of this and similar cases lies in the diagnosis, and all are agreed that the syndrome has the closest relationship to an antecedent pericarditis. Kelly has discussed these interesting cases fully, and has laid down the part played by the liver in cases with old pericarditis. He expresses the opinion that presenting the complex of pericarditis and recurring ascites there are grouped a number of cases that differ more or less from one another. In the majority of cases he thinks the ascites follows on a perihepatitis and probably also some peritonitis, the peritoneum then becoming a *locus minoris resistentiæ*. In consequence of the pericarditis—which must be present primarily if the syndrome is to follow—the activity of the myocardium is interfered with, the heart being unable to hypertrophy owing to the pericarditis, and consequently the place that first manifests evidence of an impeded circulation is the *locus minoris resistentiæ*, viz. the peritoneum. Ascites consequently must follow. The relief afforded to the general circulation by the ascites prevents the occurrence of œdema in the extremities and other signs of heart failure. Last year Hess discussed all the published cases. From his post-mortem findings he agrees that the pericarditis is the prime cause and may be the only cause of the syndrome without a perihepatitis or peritonitis. The heart he describes in these patients as surrounded by a mass of thick disintegrated caseous material, and not as a rule either hypertrophied or dilated, and the pleura and peritoneum free from chronic inflammation. The greatly enlarged liver is markedly congested but without any connective tissue hyperplasia. Hess considers the pericardial condition to be the primary cause of the portal stasis in the cases of this group.

ALBUMINURIA IN ADOLESCENCE AND ITS AFTER-HISTORY.

A discussion took place in May of this year at the Royal Society of Medicine on this important subject, in which most of the leading medical authorities in London took part. Varied opinions were expressed as to the cases that ought actually to be included under albuminuria of adolescence. It was generally agreed that the albumen of athletes should be rigidly excluded. After severe exercise of all sorts—football, rowing, running—albuminuria invariably appears, no matter the type of individual. The amount may vary, and in some it may be accompanied by blood, but in such cases we have a definite cause.

True albuminuria of adolescence or functional albuminuria occurs only in certain types of individuals. The frequency with which it occurs has been variously stated, but, as was pointed out, if the above cases of albuminuria after severe exercise are excluded, the percentage would be undoubtedly reduced.

An undoubted true variety of albuminuria of adolescence is the so-called orthostatic albuminuria. Some of the speakers were of the opinion that this is the true functional albuminuria. The albumen in these cases, they hold, occurs always in the mid-morning urine and not in the specimen passed the first thing in the morning on getting out of bed. Posture—not the time of day or time of meals—is the essential cause. So long as the individual remains in the recumbent position no albumen appears in the urine. Other speakers, however, were rather inclined to modify this opinion, and thought posture not in itself sufficient to cause the albuminuria, but that posture plus food or posture plus food in a person of emotional temperament was necessary for its appearance.

Then there is the type—also a true functional albuminuria—mentioned by one or two of the speakers, the recognition of which is due to the Germans, Goetzky and Jehle, who made many hundred observations. This is the lordotic type. The essential feature here is a lumbar lordosis causing pressure on the renal veins. In these cases there is no intermission—the albumen appears from day to day—with-out symptoms of cardio-vascular disturbance, and no alteration in blood-pressure. In such patients, even when lying in bed, the urine sometimes can be made to temporarily contain albumen by placing a bolster under the small of the back and so producing a slight artificial lordosis. This type persists into early manhood or later. The albumen appearing in these various types is ordinary serum albumen, and may vary in quantity from a large amount to a small.

It was pointed out that the diagnosis in these cases is not always easy, but one may be guided in this way. If the albumen varies at various times, from none in the morning though more at 11 A.M. to less again at 5 P.M. and bedtime, then the diagnosis is exact. The albumen must be absent some time in the twenty-four hours.

The various speakers were in absolute unanimity as to the excellent after-history of true cases of functional albuminuria. Such an albuminuria has no disturbing effect on health, nor does it affect the duration of life. Such cases should not be excluded from the advantages of life insurance or from positions in public or private offices; and this in spite of the fact that the condition may spread itself over years. During this time the albumen will be very erratic in appearance, being often absent for weeks and then returning.

ABSENCE OF ABDOMINAL RESPIRATORY MOVEMENT AS AN INDICATION OF PERICARDITIS.

Wynter (*Proceedings of the Royal Society of Medicine*, 24th January 1911) has pointed out the extreme value of this sign in a condition often attended with few direct indications. The sign is always

bilateral and is therefore very obvious. It is constant in acute pericarditis, especially with fibrinous exudate. That the diaphragm is really inactive in this condition can be seen by radioscopy, no contraction of the muscle being visible, and the diaphragm lies very high in the thorax. It is a valuable sign in that it precedes and also outlasts other indications of pericarditis. It explains the cyanosis and dyspnoea in this disease, the former, resulting from respiration being restricted to the upper lobes of the lungs, and the latter indicates an effort to utilise the weight of the abdominal viscera to depress the passive diaphragm.

If the sign is wanting, and acute pericarditis suspected, doubt should be felt as to the diagnosis.

SURGERY.

DISINFECTION OF THE SKIN WITH IODINE.

NUMEROUS reports have been published testifying to the good results following the use of solutions of iodine for disinfecting the skin, and in many clinics the more elaborate methods have been given up in favour of the application of the tincture of iodine shortly before and at the time of operation. Reports of bacteriological control experiments have not been numerous, and it is interesting to note that Decker (*Deutsch. med. Wochenschr.*, No. 23, 1911), on making a number of bacteriological experiments with skin treated in the usual way with tinct. iodi (P.G. 10 per cent.), found that growths of various organisms could readily be obtained in the majority of cases.

He concludes that the tincture of iodine has not a bactericidal effect, and only serves to fix the organisms to the skin, while in view of the irritation which is not infrequently caused by the iodine vapour, the method is one which has no real advantage.

J. W. STRUTHERS.

IODINE AND SPORE-FORMING BACTERIA.

Tinker and Prince have carried out tests with iodine to determine its effects on spore-forming bacilli (*Surgery, Gynecology, and Obstetrics*, June 1911). A culture of *B. subtilis* was rubbed into the skin of the fingers, and after six hours allowed for drying tincture of iodine was applied. When the iodine had dried in sterile threads were drawn across the skin and then placed in bouillon. After half an hour a second application of iodine was made, and the experiment with threads was repeated. In every case growth in culture was prompt and positive. In a second series *B. subtilis* was rubbed into the skin

of the arm, which was then treated with iodine in the same way as for operations. The skin was scraped with a scalpel, and the scrapings, when cultivated, invariably showed a growth of the bacillus. The writers conclude that iodine does not fulfil the requirements for safe preparation of the skin, and they recall the report of a death from tetanus in a clean case prepared with iodine (*Brit. Med. Journ.*, 1910, vol. i. p. 1350). They suggest that the action of iodine in promoting the healing of wounds does not depend only on its antiseptic property, but also on its counter-irritant effect leading to a local leucocytosis.

Similar tests to those described above were carried out with Harrington's solution. In every instance, after three minutes' application of the antiseptic, cultures proved negative. The authors now use this solution in the preparation of the patient's skin, applying it with friction for two and a half minutes, and sponging it off with alcohol.

[The formula for Harrington's solution is:—Corrosive sublimate, 16 grs., commercial hydrochloric acid, $2\frac{1}{2}$ ozs., distilled water, 11 ozs., with methylated spirit, $26\frac{1}{2}$ ozs., added.]

JAS. LOCHHEAD.

IODINE AND PERITONEAL ADHESIONS.

Propping is of opinion that the iodine methods of disinfecting the skin of the abdomen indirectly favour the formation of peritoneal adhesions (*Zentralbl. f. Chir.*, 13th May 1911). The iodine gains entrance to the cavity either by the bowel lying in contact with the skin or by the flushing of the field of operation with saline solution. After referring to the use of iodine in promoting adhesions between serous surfaces, he records his experimental results. The injection into dogs of 20 drops of tincture of iodine in 80 c.cm. of saline solution was followed in forty-eight hours by the formation of numerous adhesions in the region of the liver and stomach. The small intestine was free from adhesions, but this was probably due to the restlessness of the animals, and it would not occur in a patient after operation. In Rehn's clinic, since the introduction of the iodine methods, 5 cases of ileus, due to kinking or adhesions, had occurred out of 70 cases of appendicitis; in 300 cases not prepared with iodine only 5 instances of mechanical obstruction had been met with. The adhesions also tended to favour the occurrence of residual abscesses.

JAS. LOCHHEAD.

STERILISATION OF THE SKIN BY A CARBON-TETRACHLORIDE IODINE SOLUTION.

Since the introduction of tincture of iodine as a skin disinfectant many different solutions have been tried. As alcohol does not dissolve

fat, attempts have been made to increase the penetration of the iodine by the application of ether or by the substitution for the alcohol of substances such as benzene or acetone. After a number of experiments with various solutions and combinations of alcohol, chloroform, benzene, acetone, ethylene dichloride, toluene, glycerine, and carbon-tetrachloride, Ellice McDonald (*Med. Record*, 15th April 1911, p. 675) found that the best results were got with a 2 per cent. solution of iodine in carbon-tetrachloride. The latter substance is a heavy anæsthetic fluid, not unlike chloroform, with considerable odour, and is a powerful fat solvent. It does not burn or explode, and is comparatively unirritating. It has also a fairly strong antiseptic action. The technique recommended is preliminary shaving and washing of the part with an antiseptic soap on the night before operation and the application of a dry sterile towel. At the operation the iodine solution is rubbed into the skin with a piece of gauze for one or two minutes. The mixture rapidly dries, leaving the skin ready for the incision. During the last three years McDonald has used this method in all his abdominal operations with uniform success. In a long series there has been no case of suppuration from the skin.

JAMES M. GRAHAM.

RESULTS WITH MOORHOF'S BONE WAX.

In the surgical clinic at Minnesota the use of Moorhof's wax has proved highly successful (J. Clark Stewart, *Annals of Surgery*, May 1911). It has been regularly used to fill any bony defect—in cavities made in healthy bone, after removal of fragments in compound fractures, in acute osteomyelitis both as a temporary and a permanent filling, in all forms of subacute and chronic osteomyelitis including bone abscess, and in tuberculosis of bones and joints. Primary union has been regularly obtained in chronic and subacute osteomyelitis and tuberculous affections, and in acute osteomyelitis temporary drainage has generally been sufficient to ensure the retention of the wax and the closure of the wound over it. In no case did extrusion of the wax take place, and even if the wound reopened and exposed the wax, granulations subsequently covered it *in situ*. The technique was as follows:—In acute infections operated on under Esmarch's ischemia the cavity in the bone was swabbed with carbolic acid and one minute later with alcohol, then dried and filled with wax. The soft parts were sutured and drained before the elastic bandage was removed. In subacute and chronic conditions, first the Esmarch bandage was removed and all bleeding checked, then the bone cavity was dried by alcohol, pressure and hot air, and filled with wax; the periosteum and soft parts were closed without drainage. The period of absorption of the wax was not determined, but in one case there was little change after

a year. Iodoform poisoning was never observed, even after a pound of 40 per cent. wax had been inserted. Duvergey, however, reports one case of poisoning which proved rapidly fatal after the introduction of only 30 c.cm. of the wax, and another in which the toxic symptoms were severe but disappeared rapidly after the plug was removed from the bone cavity (*Gaz. Heb. d. Sc. Méd.*, 28th May 1911).

[Moorhof's wax is a mixture of powdered iodoform in equal parts of oil of sesame and spermaceti.]

JAS. LOCHHEAD.

GASTRIC AND DUODENAL ULCERS.

W. Mayo (*Boston Med. and Surg. Journ.*, 6th April 1911) refers to some of the statistics obtained at the Rochester clinic in cases of gastric and duodenal ulcer. In only 10 per cent. of patients with stomach symptoms is there any demonstrable disease of the stomach. In about one-third of the cases the symptoms are due to a general disease such as cardiac or renal insufficiency, arteriosclerosis, pernicious anemia, or they antedate pulmonary tuberculosis. Unnecessary operations on the stomach are occasionally performed for the gastric crises of tabes. Atonic dilatation, gastropptosis and gastric neuroses account also for a third of gastric complaints. These conditions are due to an unstable nervous system or to congenital physical defects. In the author's words, "To treat these patients successfully we would have to begin four generations back, and even medicine has its limitations." In about 20 per cent. of the cases the symptoms are referable to disorders of other parts of the alimentary tract or of the abdominal organs. Disturbance of the assimilative tract brings about closure of the pylorus, which delays the passage of food from the stomach: the result is indigestion, as so often seen in cases of appendicitis or gall-stones.

The acute ulcers of chlorosis and the erosions of the gastric mucosa in cirrhosis of the liver and in certain blood diseases are toxic in origin.

Neither experimentally nor clinically do these types of ulcer produce the typical chronic callous ulcer of the stomach or duodenum. Exploratory operations have in recent years established more exactly than was possible before from post-mortem examinations the relative frequency of gastric and duodenal ulcers. In 1000 cases operated on at St. Mary's Hospital for gastric or duodenal ulcer, up to 17th January 1911, 74½ per cent. were males and 25½ per cent. females.

The proportion of duodenal to gastric ulcers has been estimated from 621 consecutive cases, of which 64½ per cent. were duodenal and 35½ per cent. gastric. In 3 per cent. there were ulcers in both situations. The operative mortality for all these cases was 2·4 per cent. including gastro-enterostomies, excisions of ulcers, and all deaths in

hospital from any cause. Ninety per cent. of the ulcers of the stomach were on the lesser curvature, the majority of the remainder on the posterior wall. Less than 6 per cent. of the ulcers were multiple—occasionally there was a contact ulcer on the opposite wall of the stomach. In the case of the duodenum Mayo recommends in addition to a gastro-enterostomy infolding of the ulcer by two or three mattress sutures, as employed by Moynihan. Gastric ulcers, wherever possible, should be excised, as they may be the starting-point of a cancer. Wilson and McCarty found that out of 300 resections of the stomach for cancer 71 per cent. showed that the cancer had started in an ulcer. Gastro-enterostomy is, as a rule, advisable after excision of an ulcer, as the motility of the stomach is liable to be impaired.

JAMES M. GRAHAM.

OPERATIVE TREATMENTS OF FRACTURE OF PATELLA.

Jas. E. Root (*Yale Medical Journal*, March 1911) records thirty-nine consecutive successful cases of wiring fractured patellæ. He is a firm believer in the operative treatment, and considers it imperative where there is wide separation of the fragments, wide tearing of the capsule and lateral ligaments, and much effusion. One of the most beneficial results of the operation he holds to be the clearing out of the blood and lymph from the bursa and joint cavity, as the blood and lymph becoming organised produce stiffness and long-continued loss of flexion. Another benefit is the shortened period of convalescence (six weeks)—of great importance in the case of breadwinners.

In all his thirty-nine cases he obtained early bony union and function, and had no deaths, no case of joint infection, no case requiring subsequent removal of the wire. X-rays illustrate his contention that bony union is obtained. He uses a longitudinal median incision, and two or three sutures of No. 16 silver wire inserted in the longitudinal direction, avoiding the articular surface of the patella. A posterior board splint is applied for twenty-four hours only. The strength of the wire sutures can be depended on, and the early freedom of the joint ensures quicker and more perfect movement. In the second week he commences passive lateral movement of the patella. In a week after operation his patient is out of bed, walks with crutches in two weeks, and with a cane in three weeks.

He delays operation until ten or fourteen days after the accident, when inflammation will have subsided and any abrasions healed. He depends on his aseptic technique for ensuring primary healing. One of his patients walked fifteen miles in the fifth week after operation without the aid of cane or crutch.

PIRIE WATSON.

STRICTURE OF URETHRA.

G. K. Swinburne (*Amer. Journ. Surg.*, May 1911) has been impressed with the apparent fact that tight hard fibrous stricture of the urethra is far less common now than it was even a few years ago. He conjectures that fibrous stricture is often due to the use of strong irritating injections, employed with the idea of aborting the disease, or to the unskilful use of instruments.

A number of years ago he employed a single injection of 2 per cent. solution of silver nitrate in three cases of primary gonorrhœa, with the purpose of aborting the disease, and all three developed stricture a few months later. Since that time he has met with several cases in which stricture followed a course of injections of silver nitrate.

The fact that during the past fifteen years or so the newer preparations of albuminates of silver have become so widely used may readily explain the reason of the smaller number of cases of stricture that we now see.

Another cause of the formation of stricture may be the injudicious and rough use of urethral bougies causing slight bleeding, and hence urinary extravasation with the accompanying local inflammatory areas.

Swinburne has been struck with the many cases of chronic urethritis in which stricture has been diagnosed and treated by bougies without improvement, and in which examination revealed no stricture but chronic prostatitis or chronic posterior urethritis.

Spasm of the compressor muscle is often mistaken for a tight stricture by men of large experience. A case is given in illustration where stricture was diagnosed, but the posterior urethroscope showed no stricture but an erosion of the posterior urethra. The local application of silver nitrate cured the condition. Spasm of the compressor muscle should not be called spasmodic stricture because it is a muscular contraction due to irritation behind the compressor muscle in the deep urethra. Removal of that irritation will remove the spasm.

Swinburne condemns the passage of bougies into the bladder as the routine procedure whenever a young man presents himself with a chronic urethral discharge. Many cases of bladder infection of long standing result. Chronic urethral discharge does not mean stricture. Stricture may give rise to a chronic urethral discharge, but in the majority of cases of chronic urethral discharge there is no stricture but a lesion in the posterior urethra.

PIRIE WATSON.

DISEASES OF CHILDREN.

By A. DINGWALL FORDYCE, M.D., F.R.C.P.,
Extra-Physician, Royal Hospital for Sick Children.

VACCINE THERAPY.

BULLOCH, at the Royal Society of Medicine on 1st June 1910, said: "So far as I have been able to learn, the profession can be resolved into four groups with regard to the question of the value of vaccine therapy. There is, first, the clinician, who boldly and publicly asserts that as a result of his experience he is unable to subscribe to the view that the results of vaccine therapy are better than those obtained with other well-tried methods. This group appears to be small.

"There is a second and much larger group who allege this in private, but for various reasons do not assert it in public. This seems to include a large number of clinicians. A third and small group condemn vaccine therapy by word of mouth, but practise it by hand. I feel sorry to refer to this group, and I only do so because I know it exists.

"Lastly, there is a group, in which I reckon myself, who consider that results can be achieved by vaccines which have not hitherto been obtained by other and older methods. . . . I believe we have hitherto seen the worst of vaccine therapy, and better results will be achieved when it is recognised that this method is not to be looked upon as a *dernier ressort*. . . . The attitude of the clinician is nevertheless remarkable. If a desperate case gets well on vaccines it is alleged to be a question of chance; if it does not get well, the case but confirms the unfavourable opinion which the clinician expressed."

In the course of the year which has passed since Bulloch aired these views considerable changes have taken place in the attitude of many of the medical profession in relation to vaccine therapy. Many valuable data have been accumulated, the method of treatment has become more widespread and more intelligently practised, and though the sphere of usefulness of the therapeutic inoculation with dead cultures of bacteria is still undefined, the practice of this form of treatment is recognised as an important adjunct of therapeutic medicine.

Hamill (*Arch. of Ped.*, February 1911), after referring to results published by Alice Hamilton and Jean M. Cooke (*Journ. of Infants' Diseases*, 1908, vol. v. p. 158), Butler and Long (*Journ. of Amer. Med. Assoc.*, 1908, vol. i. p. 744, and *Ibid.*, vol. ii. p. 1301), and Churchill and Soper (*Journ. of Amer. Med. Assoc.*, 1908, vol. ii. p. 1298), regarding the treatment of gonococcal vulvo-vaginitis in young children by means of a gonococcic vaccine, which went to show that the effect on the disease was by no means marked, quotes Hamilton (*Journ. of Amer. Med. Assoc.*, 1910, vol. i. p. 1196), whose results were much more

favourable. Hamilton treated 84 cases with vaccines, and had 76 cures and 8 failures. The cure consisted of an absence of gonococci after four bacterial examinations of the secretion from the vagina, made at intervals of a week, followed by two examinations at an interval of two weeks. Nineteen of his cured patients were seen five months after the last evidence of infection had been present and were all found free from gonococci.

Howland and Hoobler (*Arch. of Ped.*, September 1910) write: "We have used stock gonococcus vaccines as a routine measure in the vaginitis ward of Bellevue, in conjunction with the usual irrigation treatment. Several cases in the outpatient department have been treated with vaccines alone. In many cases the combination of vaccine and irrigation treatment cause the discharge to be very greatly diminished or to disappear, but the period of observation was not sufficient to enable us to draw any conclusions as to the ultimate outcome. A few cases in the hospital treated until the discharge had ceased appeared in the outpatient department with a profuse discharge. We have not been impressed by the efficacy of this form of treatment, and believe, with the majority, that it improves symptoms but rarely effects a permanent cure."

Howland and Hoobler also treated over fifty children suffering from pneumonia with pneumococcic vaccines, but were unable "to report any apparent beneficial results from their use, nor were there any unfavourable ones." Both autogenous and stock vaccines were used in these cases.

The same authors found that cases of general furunculosis usually yielded readily to treatment by autogenous vaccines of *staphylococcus pyogenes aureus*, and they say, "Our experience with autogenous vaccines in localised staphylococcus infections has been entirely satisfactory. Their value can hardly be over-estimated." They also report 3 cases of staphylococcal septicæmia successfully treated by vaccines.

Local infections due to the streptococcus, such as empyema and otitis media, yield less readily to vaccine treatment than do similar infections due to the staphylococcus, while in cases of general streptococcal infection it is usually difficult to tell what part the vaccine played in the favourable issue.

Treatment of local and general conditions caused by infection with *bacillus coli* has been largely carried out, but few results have been published.

As regards treatment with tuberculin Hamill says: "In summing up, it may be repeated that the results from the vaccine treatment are much more satisfactory in early life than in later life, and localised tuberculous lesions, especially the glandular types of tuberculosis, are much more favourably affected than the pulmonary type, especially those with generalised symptoms."

ALBULACTIN.

Within the past few months this much vaunted powder has been widely used by practitioners in cases of difficulty in infant feeding. Atrophy, malnutrition, marasmus, inanition, prematurity, diarrhoea, and vomiting are only some of the titles of affections which are reported to have responded as by magic to treatment by this soluble powder consisting of the albumen of cow's milk.

Papers such as those by Harris and Coomber (*Med. Times*, 29th April 1911) and Wainwright (*Med. Magazine*, March 1911) have been published to show the value of its employment, but their results are by no means conclusive to the unbiassed reader. The exact determination of cause and effect in infant feeding is a complicated problem.

Theoretically the provision to practitioners of albulactin is a distinct step in advance, more particularly in a country where the finer modifications of milk are not usually practicable. And practically, so far as can be at present determined, and so far as the experience of the present writer goes, albulactin answers extremely well to the expectations formed of its dietetic value.

THUMB-SUCKING.

Kiernan (*Pediatrics*, April 1911) controverts the theory of Freud that thumb-sucking is an auto-erotic phenomenon.

Freud says: "Thumb-sucking, which manifests itself in the nursing babe, and which may be continued until maturity or throughout life, consists in a rhythmic repetition of sucking contact with the lips wherein the purpose of taking nourishment is excluded. Pleasure sucking is connected with an entire exhaustion of attention, and leads to sleep or even to a motor reaction in the form of an orgasm. The most striking character is that the impulse is not directed against other persons, but that it gratifies itself on its own body. It is, moreover, clear that the action of the thumb-sucking child is determined by the fact that it seeks a pleasure which has already been experienced and is now remembered.

"We would say that the child's lips behaved like an erogenous zone, and that the excitement through the warm stream of milk was really the cause of the pleasurable sensation. To be sure, the gratification of the erogenous zone was at first united with the gratification of taking nourishment, but the desire for repetition of the sexual gratification is separated from the desire for taking nourishment. Not all children suck their thumbs. It may be assumed that it is found only in children in whom the erogenous significance of the lip-zone is constitutionally re-enforced. Children in whom this is retained are habitual kissers as adults and show a tendency to perverse kissing, or as men they have a marked desire for drinking and smoking."

Kiernan, on the other hand, contends that the phenomena of sucking have not the specific simplicity claimed for them by Freud. To the reflex of sucking he applies the term reflex of aggression; to that of vomiting, reflex of rejection or repulsion.

The conscious movements based on these reflexes are termed respectively movements of aggression and repulsion.

After discussing the physiology of these types of reflex and adducing examples he says: "There is no order of movements which, under the cover of instinct, can be pushed in between conscious and reflex movements. The first instinct of a child would be the instinct for food. There is absolutely nothing in the sensation of hunger which would acquaint the child with the means of remedying this pain. It attains naught but the concept of pain. In the general restlessness it displays and in the convulsions ultimately resulting from anemia there is nothing which could be likened to an instinct for food. If the child has not to depend on its own resources, but has a nipple put into its mouth, then the sensation thus excited starts the reflex mechanism of sucking. The child has thus acquired the concept that the sensation of satiation is connected with the act of sucking, and these two sensory memories are associated with the innervation-sensations aroused by sucking, and probably by the scent of the mother's breast. That a child should suck at every finger may be attributable to a reflex mechanism, but the sucking of the child in dreams proves that the act of sucking has produced images which have been registered in the cortex. The factors of this primary abstract ego are not definitely defined. . . . The nature of the ego does not depend upon any definite order of memories, but is determined simply by the most firmly fixed memories. . . . As soon as movements of aggression have taught the child to take hold of things it is evidently under the impression that it is living in a world of sweets; it takes everything to the mouth and licks it. A later aggressive movement—kissing—like the first sucking movements, is probably based upon the act of bringing an attractive object to the mouth. This latter movement is clearly dependent upon a powerful secondary presentation aroused by its impressions, just as the sucking movements during sleep denote secondary presentations excited in the course of dreams. Erethism may appear at birth, and an accidental co-existence of any motor display might lead to an association which under the rhythmic law of the nervous system would tend to recurrence, the erethismic state awakening the motor display, and the motor display arising from another cause, tending to arouse the erethism. The condition here is essentially that of the erotic symbolisms or fetchism phenomena at the sexual orgasm when great emotional exaltation exists, and the will is in abeyance in consequence. A man may be then seized by an obsession differing in character from the voluptuous. Seeing a woman's shoe, he

is unable therefore to experience sexual emotion without this conception. This amply suffices to explain all auto-erotic phenomena of thumb-suckers. These are of fortuitous origin not necessarily part of the practice."

MENTAL DISEASES.

By JAMES MIDDLEMASS, M.D., F.R.C.P.,
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THE CORTICAL NERVE-CELLS IN GENERAL PARALYSIS.

LAIGNEL LAVASTINE and Pitulescu have examined the brains of three general paralytics by means of Bielschowski's method, and report the results (*L'Encéph.*, December 1910, p. 417). They also examined the brain of an old man who died without any mental disturbance at the age of 90. They introduced a few modifications into the method, and these are described. The examination was directed especially to the state of the neuro-fibrils of the nerve-cells of the cortex. They report that in all the three cases of general paralysis they examined these neuro-fibrils were found to be diseased. The intra-cellular fibrils were affected to a greater degree than the extra-cellular, and those of the small pyramidal and polymorphous cells than of the large pyramidal and giant cells. The change was most unevenly distributed, healthy cells lying side by side with others extensively degenerated. The change is therefore not a general one, but affects individual cells. The most vulnerable parts of the cell are the base near the axone and round the nucleus. The dendrites appear to be specially resistant. They give what they conceive to be the stages in the process of degeneration, and state that many of these can be seen in a single cell. They, however, make no suggestions as to the pathology of the process. The microscopic changes observed are illustrated in three plates.

BODY TEMPERATURE IN PARALYTIC DEMENTIA.

A. B. Coleburn reports the results of his investigation of this subject (*Amer. Journ. of Ins.*, April 1910, p. 551). The number of cases studied is not mentioned, but the records were kept in some cases for two years continuously, the temperature being taken every four hours day and night. The results were compared with a standard daily chart for a healthy person prepared by various observers. Examinations of the blood were made from time to time to investigate the relation of the temperature to the number of leucocytes.

He arrives at the following conclusions:—In the early stages of

the disease there is no appreciable departure from the normal. The usual physiological variations caused by the time of day, ingestion of food, sleep, and exercise, were observed in his cases.

As the disease progresses, emotional disturbances, paralytic and congestive seizures, slight physical ailments, &c., produce effects on the temperature out of proportion to the causes. Sometimes elevation of temperature occurred for which no cause could be found.

Inflammatory changes in the brain and cord usually cause elevation of temperature with leucocytosis. The diagnostic value of temperature variations is not great. Elevated temperatures are often due to excitation of the central nervous system, but the demented state, while lower in average than the maniacal, is no nearer the normal curve.

KERNIG'S SIGN IN GENERAL PARALYSIS AND ARTERIO-CAPILLARY FIBROSIS.

In this short paper Stern gives the results of a series of investigations (*Journ. of Nerv. and Ment. Dis.*, August 1910, p. 496). His main conclusions are that Kernig's sign is a valuable, though not invariable, indication of pial thickening, and that it is never present without arterio-capillary fibrosis. In one case examined post-mortem arteriosclerosis was marked, and, in addition, a pronounced subdural membrane was found. The symptoms produced by this latter condition are usually so obscure that any clinical evidence which may indicate its presence should be carefully investigated. It is possible that Kernig's sign may prove to be such evidence, especially when found in conjunction with eye-symptoms, headache, and so on. Kernig's sign, it may be mentioned, is an inability to extend the leg in the sitting position owing to spasm of the flexor muscles.

A REACTION OF THE URINE IN GENERAL PARALYSIS.

This reaction is obtained by adding 5 to 10 drops of a solution of nitrate of mercury in dilute nitric acid to urine, and boiling. In some cases a black precipitate is obtained. Jeffimoff stated that this reaction was characteristic of helminthiasis. Butenko, as a result of his investigations, was of opinion that it was also characteristic of general paralysis. He found it in 84 per cent. of such cases examined. Further research by others does not quite confirm this view. Stucken reports (*Munch. med. Wochenschr.*, 18th April 1911) his experience of this test in 157 cases of various diseases, mostly mental. Each case was, as a rule, tested several times at intervals. Of the 27 cases of general paralysis 21 showed the test positive on at least one occasion, but a higher percentage was found in cases of cerebral syphilis and in

tabes. Considerable percentages were found in epilepsy, alcoholism, and senile arteriosclerosis, and very markedly in uræmia. The reaction cannot therefore be regarded as specific, and Butenko's claim accordingly falls to the ground. Stucken made an attempt to determine the chemical nature of the substance giving the reaction, but was unsuccessful. It is stable towards heat, is easily destroyed by acids, and is insoluble in ether. It seems to have an unstable character, which makes its investigation exceedingly difficult.

BACTERIAL INVASION IN CASES OF MENTAL DISEASE.

Judging from the number of papers issued from the Danvers State Hospital the work in its pathological laboratory covers a wide field. One of the subjects studied is that mentioned above. It has considerable importance, seeing that it may throw light on the question of the bacterial origin of some cases of mental disease. Drs. Southard and Canavan (*Bost. Med. and Surg. Journ.*, 4th August 1910) in this paper continue an account of the investigations on the same subject by the former and Gay. They examined the blood of the heart, the cerebrospinal fluid, and mesenteric lymph glands post-mortem for evidence of bacterial invasion. The cases, 50 in number, were not specially chosen but were taken almost consecutively. They do not state the form of mental disease nor the cause of death. They, however, give a table showing the number of hours after death when the bacterial examination was made. This is most instructive. It shows that the percentage of cases in which bacteria were found did not materially increase in proportion to the time after death at which the post-mortem was made, at least up to 48 hours.

The chief organisms found were staphylococcus aureus and albus, streptococcus pyogenes, and bacillus coli communis. There were a few unidentified cocci and bacilli. They note incidentally that the diphtheroid bacillus paralyticus was not found, though some of the cases were general paralytics. These organisms are not frequently found in the living condition in the situations examined by them, and it appears from the work of Orr and Rows that it is the toxins rather than the actual organisms which are the potent factors in the production of nervous lesions. The authors are not altogether of the opinion that the presence of staphylococci in the cultures should be regarded as evidence of contamination. They admit that they may gain entrance to the tissues shortly before death, but urge that further research should be made into this important matter. Such investigations should be of service in clearing up some doubtful questions in connection with oral and intestinal sepsis. As a result of their own work they do not yet feel justified in attributing any form of mental disease, or even any individual case, purely to bacterial invasion.

DIPLOCOCCUS IN ACUTE DELIRIUM.

That acute delirium is a specific entity and is toxic in origin is held by many observers, but is equally strongly denied by others. The exact nature and origin of the toxin is admitted by the former not yet to have been demonstrated, but as time progresses cases are being accumulated which at least tend to strengthen their view. Wells reports a case of this kind which came under his observation (*Amer. Journ. of Ins.*, January 1911, p. 593). The mental symptoms were typical of acute delirium, and the patient died after an illness of two weeks. Post-mortem cultures of the cerebro-spinal fluid and heart blood developed a growth of a diplococcus, which proved fatal to a guinea-pig. Its characters are described, but these do not correspond to any organism known to the author. Some of them were found in a microscopic section of the brain, in one of the vessels.

LUMBAR PUNCTURE IN THE INSANE.

Roubinovitch and Paillard have made some investigations on this subject (*Gaz. des Hôp.*, 28th June 1910). The normal pressure of the cerebro-spinal fluid has been variously stated as being from 20 to 300 mm. Quincke, who conducted his observations on human beings only, puts the normal at 150 mm., and considers all above this as abnormal. Kronig says it varies from 125 mm., when prone, to 410 mm. in the sitting posture. Sicard in two cases found a pressure of 200 mm., which he regards as normal. Parisot (1910) thinks the normal pressure varies between 60 and 120 mm.

In the author's researches the pressure was observed while the patient was lying in bed on the left side, and they found little difficulty in estimating it accurately. Their observations were made entirely on insane patients. In 55 cases the pressure varied from below 50 to above 250 mm. About 60 per cent. lay between 50 and 150 mm. In 33 cases of general paralysis the average pressure was much the same as that given above, the highest number—ten—being from 100 to 150 mm. The lowest pressures were obtained in those who were in the last stages of the disease, the highest in those who were passing through a congestive attack. In 8 cases of dementia præcox the pressure was higher on the average than in general paralysis—from 100 to 300 mm. In 5 cases of melancholia the pressure varied from 70 to 210 mm. In 2 cases of imbecility the pressure was in one 40 mm., in the other 270 mm. It will thus be seen that there is little constant relation between the pressure and the form of mental disease. The low pressure in the final stages of general paralysis and the high pressure during congestive attacks in that disease are, however, facts of importance.

The authors also studied the relation of cerebro-spinal pressure and

arterial pressure, and give the results of their observations in the form of several tables. These results show great variation, and the same may also be said regarding the effect of lumbar puncture on arterial pressure. In the majority of cases there was little change in either the pulse-rate or the blood-pressure. There was no apparent relation between the amount of cerebro-spinal fluid which escaped and the change of arterial pressure. The latter usually fell a little, the greatest fall being 45 mm., the average about 10 mm. The greatest rise in arterial pressure in the few cases in which it did occur was 15 mm. Any change produced by lumbar puncture, in one direction or the other, was transitory, passing off in a few hours. In relation to the form of mental disease from which the patient suffered, the fall of arterial pressure was most marked in those who had gross brain disease. The same was also true with respect to those who suffered from arteriosclerosis.

THE REACTIONS OF THE NERVOUS SYSTEM IN CERTAIN GROUPS OF PSYCHOSES.

An elaborate investigation has been carried out by Drs. Pötze, Eppinger, and Hess in the clinics of Professors v. Jauregg and v. Noorden in Vienna (*Wien. klin. Wochenschr.*, 22nd December 1910). Its object was to test the reactivity of the nervous system of the insane to various conditions, chiefly drugs, and compare the results with what occurs in healthy persons. The latter have already been investigated by Eppinger and Hess. The forms of mental disease examined were melancholia (30 cases), manic-depressive insanity (16 cases), and dementia præcox (60 cases). In the first class of cases, when the patients were young, there was observed an unusually low reactivity of both the sympathetic and peripheral nervous systems to such drugs as adrenalin, pilocarpin, and atropin. Four of these cases did not give in all respects the same results as the others, and three of them showed slight, but obvious, symptoms of exophthalmic goitre. In later life, at the menopause and afterwards, the cases showed a diminished tonicity of the peripheral nerves but an increased irritability of the sympathetic. In all cases of melancholia they found a diminished power of assimilation of grape sugar.

In manic-depressive cases the results of investigation were conflicting, and appeared to be related rather to the duration of the disease than to the emotional state. In the depressed phase the assimilation of grape sugar was in many lower than normal, but in some it was not. This, it has already been suggested by Raimann, may be explained by the possession on the part of those who suffer from this form of mental disease of constitutional peculiarities of several kinds, one of which is an increased power of assimilating grape sugar. In all the younger

cases there was a distinct reactivity to pilocarpin and atropin. In the maniacal stage in young people the assimilative power was high; in old persons it was below the normal. The excitability of the sympathetic system varied very much in different cases. As a general rule the tone of the nervous system as revealed by reactivity to certain drugs was at a minimum during melancholia and at a maximum during mania, and this contrast was the more pronounced the younger the patient and the fewer the attacks experienced.

These researches, though not very conclusive, are interesting, inasmuch as they indicate, so far as the nervous system is concerned, the existence of demonstrable constitutional differences in the excitability of its various parts in different individuals. These have their counterpart in constitutional emotional differences. They thus help to place the so-called humoral pathology on a rational basis.

THE CELLS OF BETZ IN MENTAL DISEASES.

In the course of a systematic examination of the cortex in various forms of insanity Ladame has come to the conclusion that their condition is in exact correlation to the degree to which the muscular system has shown symptoms of disturbance from the normal (*L'Encéph.*, June 1911, p. 532).

The state of these cells in various mental cases may be classified under three groups—1st. Those in which the cells are normal. 2nd. Those in which they are diseased. 3rd. Those in which they are more or less altered. In the first group are included all those patients who show no sign of organic disease of the muscular system. To this group belong imbeciles, cases of dementia præcox, confusion, melancholia, manic-depressive insanity. To the second belong all cases which show general muscular paralysis, cachexia, or marasmus. Such are cases of general paralysis, senile dementia, some cases of dementia præcox, of arteriosclerosis, and of profound idiocy. To the third group, in which some cells are normal, others profoundly altered, belong cases of the preceding group in their earlier stages. Ladame regards his conclusions as confirming the view already generally accepted regarding the function of the cells of Betz. He also is of opinion that the lesions to which the psychoses are due must be sought in a study of the cellular layers which form the architecture of the cerebral cortex.

CARDIO-GENETIC PSYCHOSES.

In this paper by Cotton and Hammond (*Amer. Journ. of Ins.*, January 1911, p. 467) a very complete clinical and pathological report of a case is given. The patient suffered from heart disease as well as mental disease, and died after an illness of three months. She had had a

previous attack about two years before, but from it made a complete recovery. The second attack was brought on apparently by the death of her brother. The mental symptoms were chiefly those of depression, with marked hallucinations, aggravated at night, restlessness, impaired power of attention, and occasional delirium. There was, however, great variability in the symptoms, and they were not typical of any of the better recognised forms of mental disease, such as involuntional melancholia, manic-depressive insanity, toxic psychoses, or acute delirium. The authors are inclined to place the case in a group by itself—cardio-genetic psychoses—as first described by Jakob.

The histological changes were chiefly cellular, an axonal degeneration of the Betz cells, and a chronic degeneration of nearly all the cells of the second and third layers of the cortex. This was shown by Bielschowski's method of investigating the intra-cellular fibrils. They are inclined to regard these changes as characteristic of the cardio-genetic psychoses. In their case there was a very definite myocarditis. But they do not seem to have considered the possibility of the myocarditis and the psychosis as being due to a common cause. The heart disease was revealed only after death, so that the symptoms due to it cannot have been pronounced during life.

DEPRESSIVE INSANITY.

Retun is of opinion that there are several forms of insanity with depressed emotional tone. On analysing a series of cases he finds that there are some which can be distinguished from the rest by certain features which they possess in common. He relates two of these (*Zentralbl. f. Nervenheilk. u. Psych.*, January 1910, p. 41). These and the other cases included in the group present the following features:—The attack occurs in the presenile period; there is no hereditary predisposition, and no previous mental disturbance. The onset is sudden and acute, and usually there is no obvious cause. On physical examination there are signs of general arteriosclerosis; there is slight albuminuria, the pupils are small, the patient has lost flesh, the gait is a little unsteady, and the hands tremble. Mentally the depression is the main symptom. This seems to depend on the degree to which hallucinations and delusions are present. The former are usually those of hearing; they are clear and definite, and can be precisely described. There are accompanying motor disturbances which suggest catatonia, but negativism is uniformly absent. There is no psychomotor affection. Perception, memory, and attention are intact. The duration of the attack varies from a few months to a few years, and the prognosis is uncertain. As to its etiology, arteriosclerosis appears to the author to be the most important factor; but he points out that there are no objective symptoms of the existence of this process in the cerebral vessels, though

there may be in those which can be seen and felt. It can be differentiated from catatonia by the absence of negativism, and from manic-depressive insanity by the absence of pure psychomotor disturbance.

THE RELATION OF THE MENOPAUSE TO MENTAL DISEASE.

In this paper (*L'Encéph.*, February 1911, p. 113) Rémond and Voivenel state what appear to them to be the facts relating to the menopause in both sexes. These are based on certain physiological changes, which may be arranged in three categories—hypergenetic phenomena (suprarenals and prostate), atrophic phenomena (testes and ovaries), and loss of their sexual characteristics by certain organs. All of these cause normally a temporary disturbance of the healthy equilibrium of the organism as distinct as those which accompany puberty. The disturbance is manifested by well-known symptoms—arterial hypertension, fatigue, giddiness, sleeplessness, palpitation, flushings, restlessness, mysticism, religiosity. The chief emotional disturbance is depression, which in certain cases becomes melancholia. This is usually characterised by sudden and unreasoning impulses.

DERMATOLOGY.

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and

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THE MANUAL TREATMENT OF CERTAIN FORMS OF ULCERATION OF THE SKIN.

THIS method of treatment for chronic leg ulcers and other similar ulcerations is of comparatively recent origin. In the *New York Medical Journal* of 20th May 1911, E. F. Cyriax describes the technique used by Kellgren. The treatment may be divided into (1) local manipulations on and around the ulcer ; (2) local manipulations on the affected limb or part of the body ; and (3) general constitutional manipulations.

The local manipulations round the ulcer are carried out at first by the finger-tips being placed on the skin around the ulcer and being set into rhythmic vibrations of from ten to twelve per second. After the patient becomes accustomed to this form of manipulation the fingers should be placed at a little distance from the ulcer, and whilst the vibration is applied the fingers are gradually brought nearer the ulcer. Considerable pressure is used, and if the manipulation is successfully performed the margins or even the whole ulcer will become bathed with

clear fluid (lymph). In order to stimulate the ulcer itself a piece of lint is placed over it and vibrations are set up by the fingers on the lint. If there is not much pain, by placing the hands on the skin on each side of the ulcer, setting up vibration with the fingers, and alternately regularly approximating and separating the hands, the skin around the ulcer is alternately elongated and shortened. Other methods of massage are running centripetal vibrations with the finger-tips, and friction on the deeper lying nerve trunks that lead to and from the ulcer. If the margins of the ulcer are very indurated the edge should be subjected to circular kneadings, a piece of lint being interposed between the fingers of the operator and the ulcer.

The duration of these local treatments is usually from ten to fifteen minutes once daily. The period necessary to effect a cure naturally varies with the ulcer.

In addition to local manipulations on and around the ulcer, active and passive movements of the adjacent joints are also found of service.

In cases of ulcer of the leg with varicose veins the veins should be first emptied by elevation of the limb and centripetal massage applied before commencing the local treatment of the ulcer. This is especially the case where there is any oedema of the limb. If there is much pus oozing from the ulcer, local manipulations should be maintained till the pus is extruded and replaced by serous fluid.

The effect of all these local manipulations is to promote the lymphatic and venous circulation and bathe the part in fresh lymph. Cyriax is also of opinion, from certain experimental evidence, that the vibrations have a specific effect in increasing the vital activity of the cells. The bathing of the part in fresh lymph helps the separation of sloughs.

The immediate effect of these manipulations is to remove or diminish pain if present. There is, however, a feeling of irritation and itching sometimes produced during, or immediately after, the manipulations, but that soon passes off. Ulcers which have resisted all ordinary forms of treatment often show signs of improvement within twenty-four hours after the commencement of the treatment.

HEMIATROPHY FROM SCLERODERMA.

P. C. Knapp (in the *Boston Medical and Surgical Journal*, vol. clxiv. No. 19) describes a case of this condition, and gives a summary of the previously recorded cases. The patient was a youth, aged 18, a metal-worker, in whom the left leg and arm during the last two years grew progressively weaker. On the left side of the abdomen and left thigh and leg were brownish-yellow patches of scleroderma. The muscles of the left arm and leg and left side of chest were much weaker than those of the other side. There was a slight twitching of the lips and tongue, but no hemiatrophy of the tongue. The skin of the left side

of the body was thinner, smoother, and more translucent than on the right.

Muscular wasting is a more or less frequent accompaniment of scleroderma. This atrophy is usually regarded as due partly to the enforced inactivity of the limbs where the scleroderma is extensive and partly to the compression of the vessels and nerves leading to the muscles underneath the sclerodermatous area. It has also been shown that the sclerotic process may actually invade the muscle itself. The bones may also show some degree of atrophy, and this atrophy of muscle and bone is usually most marked in the circumscribed sclerodermas, and may be so great in sclerodactylia as to lead to loss of one or more fingers. Much more rarely, however, there is a primary atrophy of the bones and muscles in parts where the skin is still unaffected. The author regards his case as one of primary atrophy, because on the affected side, apart from the small localised patches of scleroderma, the skin of the arm and leg had no "hide-bound" character such as to seriously compress the underlying parts. All recorded cases of general hemiatrophy with scleroderma except the author's and one other showed hemiatrophy of the face. The author discusses the question as to whether this condition is a nervous affection or not. Most dermatologists are disposed to regard facial hemiatrophy as a special localisation of circumscribed scleroderma, which often manifests itself in some special nerve area or spinal metamere. The majority of neurologists, from the fact that the disease is usually limited to the area supplied by the trigeminal nerve, that it is sometimes accompanied by pain and spasm of the masseters, &c., and from the results of an autopsy in which lesions were found in the fifth nerve, are inclined to regard the condition as of nervous origin. The author thinks that a complete explanation of the hemiatrophy of scleroderma, as well as of the circumscribed atrophies of face and body, cannot be given until we get further knowledge of the nature of scleroderma itself. Of the various hypotheses, the thyroid, the infectious, the vascular, and the neurotic, the latter is the most probable, but whether the lesion is a gliosis, a lesion of the sympathetic, or an angioneurosis is quite undetermined. In the only case of sclerodermic hemiatrophy which has come to post-mortem Steven found lesions in the anterior horn of the cord, but these may have been secondary to the atrophy of the muscles, and the normal electrical reactions found in most of the cases show that the changes in the anterior horn, if constant, cannot be very marked.

NEPHRITIS AS A COMPLICATION OF IMPETIGO.

Impetigo is usually regarded as a benign disease, and the majority of dermatological text-books mention no complications whatever.

Phillips (*Cleveland Medical Journal*, September 1910) records two cases where nephritis occurred in the course of impetigo. They were both in young children who had impetigo about the head, face, and mouth. There were all the usual signs and symptoms of acute nephritis, and in both cases when the skin lesions healed the nephritis disappeared. Phillips quotes Guiard as dividing the clinical types of nephritis in impetigo into two groups—(1) A nephritis which is transitory in character, without oedema, cardiac, or uræmic symptoms. There is a slight albuminuria which appears at the same time as the lesions, or a few days later, and disappears with the healing of the latter. Casts are present in the urine, and only as a rule traces of blood. (2) A more severe type of nephritis, with general anasarca, cardiac, and uræmic symptoms.

Several theories have been put forward as to the cause of nephritis in impetigo. There seems to be no relation to the drugs used in treatment. In almost every case reported there has been an improvement or disappearance of the nephritis with the disappearance of the impetigo. The most probable explanation is that the nephritis is due to an organismal infection of the kidneys, or to the absorption of toxins from the skin lesions. It is more common in those cases in which the mucous membrane of the mouth or nose is affected as well as the skin, and probably because absorption takes place much more readily from these surfaces than from the skin itself. In both Phillips's cases the mucous membranes were affected. Phillips maintains that the occurrence of a mild nephritis in impetigo is probably not infrequent, and suggests that in all cases of impetigo the urine should be examined.

SKIN ERUPTION IN ACUTE ANTERIOR POLIOMYELITIS.

Alan G. Brown* describes an eruption which was observed in six consecutive cases of poliomyelitis during a period of one and a half weeks. The rash appeared as small papules, shot-like in character, with a small inflammatory base. The papule may or may not go on to vesiculation; when it does so the vesicle is about the size of a pinhead, and contains clear fluid. The vesicle is quite hard, and those papules which terminate in a vesicle lose their inflammatory base. All stages of papules and vesicles are seen on the same patient. There were also small impalpable pigmented spots. In all cases they were present, and most abundant on the paralysed limbs. They were also scattered more sparsely over the abdomen, chest, and occasionally on an unaffected upper extremity. They did not appear to follow any definite nerve segments, nor to be in the least painful to touch. The author simply reports the occurrence of this peculiar rash, and is not prepared to say whether or not it is to be

* A skin eruption in six consecutive cases of poliomyelitis (*Canadian Journal of Medicine and Surgery*, March 1911).

associated with the paralysis. Microscopically the vesicles were found to be situated between the Malpighian and horny layers of the skin.

SCABIES CONTRACTED FROM THE CAT.

The eruption of scabies (mange) in the cat occurs usually on the head as papular, vesicular, and crusted lesions. At first the fur of the animal is matted together, and later there is some loss of hair. Around the affected areas the skin is somewhat swollen and indurated. The disease in cats is due to the *Sarcoptes minor* and not to the *Sarcoptes scabiei* as in men. Thibierge,* during the last year, has seen eight patients in three families who became infected from the cat. In such cases the eruption is not the same as is seen in human scabies. The lesions begin as raised acuminate red papules of from 2 to 3 millimetres in diameter. These papules soon present a central miliary vesicle which is broken by scratching. The lesion then becomes covered with a brown or black dry adherent crust such as characterises the papule in prurigo or in the other parasitic conditions, such as pediculosis corporis. When the condition has existed for some time the simultaneous presence of the different stages of the eruption presents an appearance of polymorphism. In many cases there is a diffuse redness of the skin, and in these red areas the papules are visible. At the edges of such red patches the papules are larger and more oedematous at their base, recalling the appearance of the eruption in urticaria papulosa. There are no long scratch marks such as are seen in pediculosis, and not usually any pustulation. There is intense itching, which is felt more or less continually, but chiefly at night. There are no burrows in the skin such as are seen in human scabies. One characteristic point in the eruption is its distribution. In this respect there are two varieties of the disease, the localised and the generalised. The localised form is due to an infection of the patient by the affected cat being allowed to sleep in the same bed. Such individuals show the eruption usually on one side of the body, where the cat is allowed to come into contact with it. In the generalised form the eruption is universal, but chiefly on the covered parts. There is usually most eruption on the anterior axillary borders, and the wrists, hands, and feet, as a rule, are completely free. The diagnosis of cat scabies in man is easy, provided one is awake to the possibility, is based on the intensity of the itching, the uniformity of the lesions, and the distribution. The absence of burrows on the hands or feet eliminates human scabies. The absence of severe scratch marks and intense lesions on the back excludes pediculosis corporis. The short history also excludes prurigo. The acari do not seem to burrow in the skin, but to remain on the surface. The treatment is

*"Sur l'éruption provoquée chez l'homme par la gale du chat" (*Gazette des hôpitaux*, 31st January 1911).

simple. After the cessation of contact with the infected animal the lesions soon die out. Sulphur should not be applied as it may increase the irritation. Thibierge recommends starch baths and Lassar's paste with $\frac{1}{2}$ to 1 per cent. menthol.

HERPES ZOSTER WITH A GENERALISED ERUPTION.*

Besides the ordinary herpes zoster there are cases of that disease in which no eruption comes out. Such cases were described in a recent abstract in this *Journal*. There is also a third class of case where the eruption becomes generalised.

In these cases the patient has an attack of ordinary herpes zoster at first. It runs a normal course, but is usually of fairly severe type, with confluent or hæmorrhagic vesicles, or with some degree of gangrene. Suddenly at different points a new eruption appears. This latter eruption has no definite arrangement, and is erythematous, papular, or vesicular. It may come out a few hours after the ordinary zoster, or several days after it, and be accompanied by fever, malaise, &c. Often there are successive crops of eruption. The lesion may remain erythematous or papular in type, or it may go on to vesiculation or gangrene as in ordinary herpes. The condition has to be diagnosed from dermatitis herpetiformis, erythema multiforme, and varicella. The last disease can be distinguished by the uniform course which the lesions run. In the zoster cases the lesion does not run the definite course which it does in varicella. In such cases, followed by a generalised eruption, the prognosis is the same as in ordinary herpes zoster. Various explanations of the condition are given. Gireaudau believes that instead of the infection being localised to one or two root ganglia of the spinal cord there is a generalised infection of multiple isolated nerve branches. Gougerot and Salin, on the other hand, describe the condition as one of immunisation. They believe that in ordinary herpes the patient becomes rapidly immune, and so the eruption goes no further; but in the generalised cases the auto-immunisation is slower and less complete, and so allows of a spread of the condition before the disease ultimately dies out.

* "Du zona avec éruption généralisée par Minet et Leclercq" (*Revue médicale du nord*, 12th March 1911).

NEW BOOKS AND NEW EDITIONS.

Cholera and its Treatment. By LEONARD RODGERS, M.D., F.R.C.P., F.R.C.S., B.S., I.M.S. Demy 8vo. pp. 236. London: Henry Frowde and Hodder & Stoughton. 1911. 10s. 6d. net.

PROFESSOR RODGERS has had extensive experience of the disease in Bengal—the cradle and chosen home of cholera. In this volume his endeavour has been to combine the accumulated knowledge and experience of the last century on the subject, with an exposition of a new method of cure. The measures adopted are an outcome of the researches made by the author into the circulatory and blood changes attendant in cholera.

In cases recently treated according to his system in Calcutta and elsewhere in India Dr. Rodgers claims “a very great reduction of the death-rate:” in fact in the last three years the death-rate from cholera in his practice is stated to have fallen by more than one-half.

The chapters which deal with the history of cholera epidemics and their lessons, epidemiology, etiology and prophylaxis, clinical description, morbid anatomy and pathology, traverse well-known ground, and thus may in a sense be said to contain nothing particularly new or noteworthy. Yet they are of value. In them a vast mass of information has been carefully studied, closely sifted, and brought together in compact and handy form. They are well written, and the facts are succinctly and luminously stated; but the lack of details is in parts a distinct drawback. The chapters are capable of and require expansion. In future editions we hope to see many points, which are now but touched on or briefly treated, elaborated in much fuller detail. Among such we may suggest Pettenkofer's subsoil theory, the bacteriology of the cholera vibrio, and diet and general management. The points involved in the differential diagnoses of cholera may also well be amplified, and this particularly with regard to certain types of malaria which closely simulate the disease. From time to time there are outbreaks of these types of fever that attain the proportions of a veritable epidemic, and it is then by no means always easy to determine the nature of the scourge. In 1881 an epidemic of this kind ravaged Amritsar in the Punjab. When it was at its height the death-rate rose to 750 per mille, and it was, and remains, a moot point whether the visitation was malarial fever or cholera.

A tremendous drain of the fluid contents of the blood is a marked characteristic of cholera. By means of the hæmatocrite the author fixes this loss at from about 36 per cent. in mild cases, to 64 per cent. in the most severe. About 54 per cent. represents a case of moderate severity. A pathological laboratory is not always available,

and it is well to know of simpler and speedier methods. A sufficiently accurate estimate of the hæmic condition may, for clinical purposes, be made at the bedside in a couple of minutes, by determining the concentration of the blood by taking its specific gravity. For this purpose Professor Rodgers uses a series of aqueous solutions of glycerine ranging in specific gravity from 1040 to 1076. The rising or sinking of drops of blood in these solutions rapidly determine the specific gravity.

The loss of salts is no less important than that of the serum. In this connection where about two-thirds of the plasma had been lost Dr. Rodgers notes, "The chlorides in the serum were slightly lower than normal, instead of being three times as great as would have been the case if no salts had disappeared from the circulation."

It is equally important to note the condition of the blood-pressure. Professor Rodgers's observations were made mainly in native patients in Calcutta by means of a mercurial sphygmometer. The normal pressure ranged from 100 to 120 mm. In the majority of cholera cases it was found at the most to have fallen below 70 mm., and was frequently as low as 50 or 60 mm.

Professor Rodgers bases his treatment on the circulatory and blood conditions above noted. The main feature is, that in a case of cholera when collapse occurs and the blood-pressure has fallen below 70 mm. he endeavours to raise the pressure again to the normal and to replace the salts and serum that have been lost. This he does by means of a sufficient intravenous injection of *hypertonic* saline solution. "By the use of hypertonic solutions," he says, "the saline content of the blood is immediately raised very considerably, with the result that the osmotic currents will tend to carry more fluid into the blood rather than to allow it to escape from it, and thus the diarrhœa is checked instead of encouraged, as by normal salt solutions."

The solution used by the author contains 4 grs. of calcium chloride, 6 grs. of potassium chloride, and 2 drs. of chloride of sodium to the pint of water. Four pints may always be injected into an adult where the specific gravity of the blood is over 1063, and another pint may be administered should the blood still require dilution to the normal point. The author has given full details and the method of injection is clearly set forth.

Dr. Rodgers attaches great importance to the internal administration of oxidising agents, to the end that toxins that are being formed in the gastro-intestinal tracts may be thereby destroyed. The substance he prefers for the purpose is potassium permanganate, which is given in pill and in sips as a drink.

While the success obtained by Dr. Rodgers is encouraging and gratifying, it must be remembered that the death-rate in cholera in various epidemics is *per se* subject to curious fluctuations. A larger

experience is essential before the true value of the work the author has done can be fully estimated. Meanwhile it may be said his book is a valuable contribution to the literature of cholera, and by the system of treatment he advocates he has put a weapon of great promise and possibilities into the hands of all who have to combat this disease. His suggestive book well deserves to be largely read and the hyper-tonic injections and internal medication widely employed.

The paper and type are good. There is a capital index. The maps will gain much in utility if in future editions coloured lines and a bolder type are used.

An Introduction to Surgery. By RUTHERFORD MORISON, Professor of Surgery, University of Durham. Pp. 162. 14 Illustrations and 5 Coloured Plates. Bristol: John Wright & Sons, Ltd. 1910. Price 8s. 6d. net. Interleaved, 9s. 6d. net.

WE know of no better book to place in the hands of the student beginning the study of surgery than Mr. Rutherford Morison's *Introduction*. It is the author's intention that this guide should be used as "a supplement to, not a substitute for, the standard text-books." In one sense it may be looked upon as supplementary to the more exhaustive works, but we should advise the junior student to read and master the supplement first; it will prevent him losing himself among the details of the larger books, and will enable him to see things in their proper perspective.

It is essentially an exposition of the general principles of surgery, and is obviously the outcome of the author's wide experience as a surgeon and teacher. The subject-matter is logically and clearly arranged, and is expressed with just that amount of dogmatism which is necessary to the successful teaching of students.

The illustrations are admirably selected to elucidate the text, and are well reproduced.

We heartily commend this work to the notice of students, and we may add that it should not be overlooked by teachers of surgery.

Fractures and Separated Epiphyses. By ALBERT J. WALTON, F.R.C.S. (Eng.). Pp. 288. London: Edward Arnold. 1910. Price 10s. 6d.

THERE is nothing particularly new in this book on fractures and separated epiphyses, but the subject has been thoroughly and clearly described. The opening chapters are devoted to the general considerations of the subject. Due importance is given to the value of massage and movement in the treatment of fractures. The principal operative

procedures are described in detail in the individual fractures, and the indications for operation are discussed in a practical manner. The X-ray photographs form an excellent series, and should be very useful in familiarising the student with the appearance of the common injuries.

The illustrations of the application of splints and other apparatus are lacking both in number and clearness of detail.

Gynecological Therapeutics. By S. JERVOIS AARONS. Crown 8vo. Pp. xiv.-178, with 46 Illustrations. London: Baillière, Tindall & Cox. Price 5s. net.

THE contents of this volume divide themselves into two parts. The first part is practically a pocket dictionary of minor gynecological treatment, the second part is mainly a description of the more common methods of medical gynecological treatment such as douching and tamponing. On this second part there is no criticism to offer, nor is there anything fresh or original in it to call for remark. It is different with the first part. A dictionary of treatment in any branch of medicine may be of the greatest use and value, especially to busy practitioners who have not time to consult a text-book. Such a book must, however, assume that a diagnosis has been made, and any remarks on etiology or pathology are scarcely called for. The author has, unfortunately, failed to recognise this, with the result that under some of the headings one finds small scraps of text-book information set down in a random order. Not infrequently the information is more calculated to obscure than to illuminate. In the very first paragraph of the book, for example, the busy physician who looks for help in treating a case of chronic vulvitis will probably be more alarmed than aided by finding that "the following varieties may be distinguished:—follicular, dermato-neuritic, gangrenous, and mycotic." Further, to be of any use to the practitioner, such a book must be well arranged, but in this volume there is little obvious plan of arrangement, alphabetical or otherwise.

Gynecological Diagnosis. By WALTER L. BURRAGE, A.M., M.D. (Harv.), Fellow of American Gynecological Society, &c. With 207 Text Illustrations. New York: D. Appleton & Co. Price 25s. net.

THIS book is almost entirely written from the clinical point of view, so that the salient points in the anatomy and pathology, although lightly referred to, are not entered into in great detail. Five chapters are devoted to diseases of the urinary bladder, the rectum, and diseases of the breast, the intimate relationship of affections of these organs to

gynecological disease proper being fully recognised by the author. A chapter is also devoted to gynecological affections of childhood.

The subject material is presented in an eminently practical and readable fashion. The context is short and concise though at times rather sketchy.

Such subjects as chorion-epithelioma and extra-uterine pregnancy do not receive the fulness of description their importance warrants. The author deprecates the use of the uterine sound for any other purpose than diagnosis.

The text is profusely illustrated, though many of the illustrations are little more than diagrams, so that we do not consider this a prominent feature of the book.

The value of the book would have been greatly enhanced if more detail of the pathological conditions had been presented.

The microscopical examination of uterine scrapings alone is of importance even to the general practitioner, and cannot be dissociated from clinical examination, and this in our opinion is a distinct weakness in the book. At the same time the clinical diagnosis is presented in an eminently practical manner. The context is easy to read, and we consider that the book to a very large extent meets the purpose for which it is intended.

A Study of the After-Results of Abdominal Operations on Pelvic Organs.

By ARTHUR E. GILES, M.D., F.R.C.S. Pp. 251. London: Baillière, Tindall & Cox. Price 10s. 6d.

DR. GILES is to be congratulated on the production of a work which must be of the greatest value as a reference alike to gynecologists and general practitioners. With assiduous care he has collected and grouped the after-results of 1200 cases upon which he has performed abdominal section, and has given in a realistic form definite information upon a subject which has been the theme of much unfounded speculation. Naturally it is highly statistical, but it is tabulated in as simple a manner as is possible in dealing with such intricate matter.

Perhaps the subject of most practical importance is that of the removal of the ovaries. In 91 per cent. the condition of the patients' health was improved. Flushes occurred within three months in 80 per cent., and lasted on the average three or four years. Sexual appetite was retained *in statu quo* or increased in 68 per cent. There was no evidence of a single case in which masculine characteristics were assumed, and mental depression of even a slight degree only manifested itself in 10 per cent. Such figures entirely refute popular ideas, and are only in keeping with the experience of other operators.

After subtotal hysterectomy not a single case of subsequent malignancy of the cervix was noted.

The preservation of the ovaries after removal of the uterus seemed only to delay the onset of the menopause for a few years, while the sex instincts were never altogether lost.

Close observations have also been made on the effect of hysteropexy on subsequent pregnancy, in which out of forty-four cases no difficulty in labour occurred. The operation advised is stitching the lower part of the uterine body to the anterior abdominal wall, including the fascia.

There are many other statistical points of much interest on the removal of the ovary, on myomectomy, and on hysterectomy for cancer.

Altogether it is a work of the highest value, and should find a place in the library of every gynaecologist.

NOTES ON BOOKS.

THE purpose of Professor White's book, *Outlines of Psychiatry* (The Journal of Nervous and Mental Disease Publishing Company), as originally issued, was to form a helpful guide to the students of his clinique at the Government Hospital for the Insane at Washington, so that they might more easily and satisfactorily follow his lectures. The appearance of a third edition within three and a half years is pretty good evidence that the object has been more than fulfilled, and that the work appeals to a wider field.

The changes introduced in the latest edition are not of great moment, being chiefly in the way of a moderate elaboration of the more important chapters. Reference to the definition of insanity is no longer included as having little more than legal interest, while, being of more practical use to the physician, questions of treatment, including psychotherapy and psycho-analysis, are more fully discussed. In the consideration of causes, classification and symptomatology the teaching of Kraepelin is closely followed, mania as a disease being unrecognised apart from the manic-depressive psychoses, of which, as also of dementia præcox, a full and comprehensive account is given. In Chapter VII. the student, or for that matter the physician, in a mental hospital will find a most complete scheme of the systematic and methodical examination of cases of insanity.

Professor White's handbook may be thoroughly recommended to the student and the practitioner, who will find therein, within moderate compass and treated in a clear and concise manner, the newer views of the subject of which it treats.

We have received Vol. XV. (Second Series) of the *Index Catalogue of the Library of the Surgeon-General's Office—United States Army*. It extends from S to Skin-Grafting.

The appearance of a fourth edition of Mr. L. Bathe Rawling's *Landmarks and Surface Markings of the Human Body* (H. K. Lewis) sufficiently attests that its popularity is not diminished, and confirms the favourable opinion we have expressed regarding previous editions.

Mr. Bland Sutton's work on *Tumours, Innocent and Malignant* (Cassell & Co., Ltd.), has become a classic. It is sufficient for us to record the appearance of a fifth edition, which has been brought fully abreast of present-day knowledge.

The twenty-eighth volume of the *Transactions of the American Surgical Association*, edited by Dr. Archibald MacLaren, contains a number of valuable contributions on advanced surgery. This publication should be in every medical library. It contains year by year the cream of American surgical literature, and constitutes a reliable index of surgical progress.

In the sixth edition of his judiciously arranged book—*Fever Nursing* (J. B. Lippincott Co.)—Dr. J. C. Wilson gives a very thorough account of the symptoms of the different fevers and of the duties of the nurse with regard to them. He avoids the common fault of writing above the heads of his readers, and does not overload his pages with useless detail. On the other hand he writes very fully on the general principles of fever nursing, and in dealing with special diseases gives just the information which the modern nurse can be reasonably expected to require. We can cordially recommend the book to nurses as a lucid and practical treatise on the subject, and while those who have been trained in isolation hospitals may feel that the chapter on the eruptive fevers is somewhat short, the work taken as a whole is exactly what is wanted by the general trained nurse who is anxious to acquire a reasonable knowledge of febrile disorders and their management. It is of handy size, well printed, and contains carefully selected clinical charts and a few excellent photographs.

Although admittedly "606" is not yet past the experimental stage, every practitioner should make himself acquainted with the present position of our knowledge of its action and uses. In "606" in *Theory and Practice*, by Professor Ehrlich and J. E. R. McDonagh, F.R.C.S. (Henry Frowde and Hodder & Stoughton), he will find in an interesting and readable form the information which he requires. Those who desire to use the drug themselves will find the methods of administration clearly and fully detailed. The dangers are pointed out and indications given as to how these may best be avoided. As the author has treated 270 cases with "606" he is in a position to make an authoritative statement as to the value of the drug. Sufficient details of cases

are given to illustrate its uses in all forms of syphilitic disease. There are three coloured plates, but these do not add materially to the value of the volume. The preface is written by Professor Ehrlich.

A Text-Book of Surgical Anatomy, by William Francis Campbell, M.D., second edition (W. B. Saunders Co.), gives a readable presentation of the anatomical knowledge required of the medical student and desirable in the practitioner. Without burdening the book with the niceties which the operating surgeon acquires by experience, the author has made an excellent selection of the outstanding facts, and has succeeded in producing a volume which is in all respects well proportioned. We suggest that its value would be enhanced by the inclusion of X-ray illustrations of the various regions of the body, a knowledge of which is essential for the interpretation of the pathological conditions. The book is well got up, and the use of clarendon type of two sizes for headings and sub-headings is to be commended.

In *Modern Surgical Technique*, by C. Yelverton Pearson, M.D., M.Ch., F.R.C.S., second edition (John Bale, Sons & Danielsson), no trouble has been spared in bringing the various sections up to date. The properties and preparation of antiseptic lotions are treated in a special chapter which includes the most recent formulæ for iodine solutions, aluminium acetate lotions, and others lately introduced. A new chapter deals with the standardisation of disinfectants. The book will continue to be of service to all who are interested in operative and wound technique.

BOOKS RECEIVED.

ADLARD & SON.—The Disorders of Post-Natal Growth and Development. By Hastings Gilford. Price 15s. D. APPLETON & Co.—Clinical Symptomatology. By Alois Pick and Adolp Hecht. Symptomatic and Regional Therapeutics. By G. Howard Hoxie. The Modern View of Syphilis and its Treatment. By Gustav Baar. The Prevention of Infectious Diseases. By Alvah H. Doty. Price 10s. 6d. EDWARD ARNOLD.—Minding the Baby. By Mrs. Leonard Hill. Price 3d. JOHN BALE, SONS & DANIELSSON, LTD.—The Life-History, Function, and Inflammation of the Appendix. By Edred M. Corner. Price 1s. The Conquest of Consumption. By E. W. Diver. Price 2s. 6d. The British Sanatoria Annual. Price 3s. 6d. CAMBRIDGE UNIVERSITY PRESS.—An Introduction to Experimental Psychology. By Charles Myers. Price 1s. CASSELL & Co.—The Student's Handbook of Surgical Operations. By Treves and Hutchinson. 3rd edition. Price 7s. 6d. J. & A. CHURCHILL.—Materia Medica. By Arthur W. Nunn. Price 3s. 6d. Diseases of the Skin. By James H. Sequeira. Price 25s. A Laboratory Text-Book of Embryology. By Charles S. Minot. 2nd edition. Price 16s. St. Thomas's Hospital Reports. Vol. XXXVIII. Price 8s. 6d. CONSTABLE

& Co.—Clinical Lectures on the Acute Abdomen. By W. H. Battle. Price 4s. LIBRAIRIE H. DELARUE.—La Maladie de Little. By Mme. Long Landry. WM. J. DORNAN.—Transactions of the American Surgical Association. Vol. XXVIII. H. ERFURT.—Tuberkulose und Syphilis Arbeiten (1890-1911). GUSTAV FISCHER.—Handbuch der Biochemie. Price 5 Marks. HENRY FROWDE and HODDER & STOUGHTON.—Emergencies of General Practice. By Sargent and Russell. 2nd edition. Price 15s. WM. GREEN & SONS.—Maternity Primer. By A. H. F. Barbour. Price 1s. Clinical Atlas of Sectional and Topographical Anatomy. By Professor Richard Berry. Price £2, 2s. CHARLES GRIFFIN & Co.—A Dictionary of Domestic Medicine and Household Surgery. By Spencer Thomson and J. C. Steell. 39th edition. Price 7s. 6d. FREDERICK H. HITCHCOCK.—Transactions of the American Association of Genito-Urinary Surgeons. Vol. V. 1910. FRANK HOWARD.—St. Luke's Hospital Medical and Surgical Reports. Vol. II. 1910. THE JOHNS HOPKINS PRESS, BALTIMORE.—The Johns Hopkins Hospital Reports. Vol. XVI. JAMES & SONS, BOMBAY.—Physiology of the Central Nervous System and the Special Senses. By N. Vazifdar. Price 2s. 8d. JOURNAL OF NERVOUS AND MENTAL DISEASE PUBLISHING Co.—The Wassermann Sero-Diagnosis of Syphilis in its Application to Psychiatry. By Felix Plant. Mental Mechanisms. By William A. White. Price \$2.00. S. KARGER.—Die Syphilis. By F. Weber. HENRY KIMPTON.—Modern Treatment. Edited by H. A. Hare. 2 Vols. Price £3. Diseases of Nose, Throat, and Ear. By Wm. L. Billenger. Price 28s. Diseases of the Eye. By J. E. Weeks. Price 30s. P. S. KING & SON.—Medical Revolution. By Sidney W. Macilvaine. Price 2s. 6d. H. K. LEWIS.—Essays and Clinical Studies. By F. G. Crookshank. Price 7s. 6d. Pharmacopœia of the Queen's Hospital for Children. 1911. 5th edition. Price 2s. 6d. Practical Forensic Medicine. By C. Graham Grant. 2nd edition. Price 2s. Diseases of the Lungs and Pleuræ. By Sir R. Douglas Powell and P. Horton-Smith Hartley. 5th edition. Price 21s. The New Sydenham Society—Retrospective Memoranda. By Sir Jonathan Hutchinson. E. & S. LIVINGSTONE.—Anatomy of the Brain and Spinal Cord. By J. Ryland Whittaker. 4th edition. Price 5s. 6d. LONGMANS, GREEN & Co.—The Chemistry of Synthetic Drugs. By Percy May. Price 7s. 6d. SAINT LOUIS MEDICAL SCIENCE PRESS, U.S.A.—Andreas Vesalius. By James Morris Ball ROBERT MACLEHOSE & Co., LTD.—Regimen Sanitatis. By H. Cameron Gillies. MACMILLAN & Co.—Human Physiology. By Professor Luciani. Price 18s. Disease in Bone and its Detection by the X-Rays. By E. W. H. Shenton. Price 4s. 6d. Introduction to Therapeutic Inoculation. By D. H. Carmalt Jones. Price 3s. 6d. Chemistry of Food and Nutrition. By Henry C. Sherman. Price 6s. 6d. W. B. SAUNDERS Co.—Differential Diagnosis. By Richard C. Cabot. Price 24s. Collected Papers by the Staff of St. Mary's Hospital Mayo Clinic. 1905-1909. Price 24s. Diagnostic Therapeutics Technique. By Albert S. Morrow. Price 21s. Hospital Management. Edited by Charlotte A. Aikens. Price 13s. Practical Cystoscopy. By Paul Pilcher. Price 24s. Handbook of Practical Treatment. Edited by John H. Musser and A. O. J. Kelly. 2 Vols. Price 75s. A Text-Book of Medical Diagnosis. By J. M. Anders and L. Napoleon Boston. Price 25s. What to Eat, and Why. By G. Carroll Smith. Price 12s. Studies in Cardiac Pathology. By George W. Norris. Price 21s. SHAW & SONS. The

Mechanism of the Heart Beat. By THOMAS LEWIS. SMITH, ELDER & Co.
 Hygiene for Nurses. By HERBERT W. G. MACLEOD. ALEXANDER STENHOUSE.
 —Recent Advances in Hematology; being the Dr. James Watson Lectures for 1910. By WALTER K. HUNTER. Price 5s. OLIVER & BOYD.—Laboratory Reports, Royal College of Physicians, Edinburgh. Vols. X.-XI. Pleurisy. By ALEXANDER JAMES. Price 6s. 6d. REBMAN, LTD.—The Experimental Chemotherapy of Spirilloses. By Ehrlich and Hata. Price 12s. Public Hygiene. By THOMAS S. BLAIR. 2 Vols. Price 42s. What Shall I Eat? By F. X. GOURAD. Price 6s. Ophthalmic Therapeutics. By A. DARIER. Price 17s. The Modern Treatment of Alcoholism and Drug Narcotism. By C. A. M'BRIDE. Price 6s. The Treatment of Syphilis with Salvarsan. By WECHSELBAUM and EHRLICH. Compendium of Regional Diagnosis in Affections of the Brain and Spinal Cord. By ROBERT BING. Price 10s. 6d. JULES ROUSSET.—Précis d'auto-suggestion volontaire. By G. BONNET. 2nd edition. Price 3 frs. 50. Précis d'Electrothérapie et de Radiothérapie oculaires. By A. LEPRINCE. Price 3 frs. 50. Les Localisations Cérébrale. By JEAN FERRAND. Price 1 fr. 50. La Sérothérapie. By EM. POZZI-ESCOOT. Price 1 fr. 50. GEORG THIEME.—Veröffentlichungen der Robert Koch-Stiftung. Heft 1. M. 3. Heft 2. M. 2.20. E. B. TREAT & Co.—Transactions of the American Pediatric Society. Vol. XXII. VIGOT FRERES.—Thérapeutique usuelle du Practicien. By ALBERT ROBIN. 2nd série. Price 8 frs. WILLIAMS & NORGATE.—Health and Disease. By W. LESLIE MACKENZIE. Price 1s. Crime and Insanity. By C. A. MERCIER. Price 1s. WM. WOOD & Co.—American Practice of Surgery. By BRYANT and BUCK. Vol. VIII. JOHN WRIGHT & SONS, LTD.—The Medical Diseases of Children. By REGINALD MILLER. Lateral Curvature of the Spine and Flat-Foot. By J. S. KELLETT-SMITH. Price 5s. 6d.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL NOTES AND NEWS.

The R. C. P. Laboratory. A CHARGE is sometimes made against the Edinburgh Medical School that its younger members do not devote enough time to increasing its reputation by making original contributions to the advancement of medical science. Those who know the real facts of the case are aware how little basis there is for such a criticism, and the appearance of the tenth and eleventh volumes of the *Reports of the Royal College of Physicians' Laboratory* (Edinburgh: Oliver & Boyd) furnishes a fresh proof of the existence of a real spirit of research in Edinburgh.

During the last twenty years, and especially during the superintendency of Professor Noël Paton, this institution has been turning out a gradually increasing volume of original work. The genesis of the laboratory by the Royal College of Physicians was largely due to the initiative of Sir John Batty Tuke, who, to the regret of all concerned, now finds it necessary to lay down the curatorship, of which office he has been the first holder. To its maintenance the Royal College of Surgeons has for many years made a substantial contribution, and no more striking testimony to the success attending the efforts of the two Colleges could be found than the fact that eight years ago the Carnegie Trust acquired the laboratory building, and thus recognised the work done in it by making its support a definite part of their Research Scheme.

The volumes just issued show evidence that the conjoint efforts of the three bodies supporting the laboratory are resulting in a continuous production of original work in all the scientific branches of medicine, and, latterly, especially in pathology. As is natural, all the contributions do not reach the standard of excellence exhibited by those of outstanding merit, but in all the authors have made painstaking efforts to elucidate the questions at issue. In considering the papers in detail special attention must be directed to the work of Gulland and Goodall on the blood: to that of Paton on diet: to the papers of Paton, Watson, and Kerr on the foetal fluids; to those of Eason on paroxysmal hemoglobinuria: to that of Wade on infective sarcoma: to those of Cranston Low on animal and vegetable parasites of the skin: to those of J. S. Fraser on the pathology of nasal conditions: to those of McGowan on

the properties of the serum in immunity reactions and on distemper in dogs: to the experimental work of Wilkie on the surgery of the abdomen: and to Berry Hart's embryological studies: nor would it be right to pass without reference the contributions to neurology by Bruce and his co-workers, Dawson and Pirie, which have been cut short by the lamented death of one of whose career research was the keynote. Looking at the volumes as a whole, and taking the work described as a sample of the sort of research work which Edinburgh turns out, we consider that Edinburgh men have good reason to be proud of belonging to a medical school which exhibits such vitality.

**The Health of the City
of Edinburgh in 1910.**

THE progress in public health matters which has taken place within the last few years well merits the epithet "extraordinary" applied to it by the Medical Officer of Health. We have, to begin with, the unprecedentedly low figure of 12·89 per thousand as the general death-rate. This, however, whilst most gratifying, must not be taken as absolutely correct, as the census which has just taken place shows that the estimated population figure exceeds by some forty thousand the actual mean population, which would have brought out a death-rate of about one per thousand higher had the latter estimate been adopted as the basis of calculation. The need for a more frequent estimation of the population, as by a five-yearly census, is here pointed out, and if we may touch for a moment on non-controversial politics, if the life of parliaments is henceforth to be five years, it might well be that the year before the general election should be taken as the census year.

Another feature of this report is the very great fall in the infant mortality, a result due not only to the efforts of the recognised Sanitary Staff, but perhaps even more largely to the corps of Voluntary Health Visitors who have shown such devotion to their useful mission. The great diminution in the death-rates from enteric and phthisis should also be noted with satisfaction, although this is indeed the general experience everywhere, thanks to the "Crusade against Consumption," which owes so much of its vitality to the pioneer work done in Edinburgh. Of the other infectious diseases measles appears to have been more than usually prevalent and fatal, and Dr. Williamson suggests, not that it should again be generally notifiable, but that one notification might be received from any one household. It is questionable, however, whether even such a system would be of use, seeing that the said case might easily have done all the mischief possible before any diagnosis could be made. What is wanted in this disease is a method of diagnosis before the exanthem appears, by which time the case has done all the infecting it is likely to do. Dr. Claude Ker's report on the work of the City Hospital is as usual of great interest, particularly with respect to his research on mixed infections and return

cases. He finds an altogether unexpectedly large proportion of diphtheria "carriers," no less than 11·8 per cent. of scarlet fever cases bearing with them unsuspected the germ of diphtheria.

The charts giving the death-rates for the last twenty years, particularly from phthisis, enteric, and infant mortality, give this report a more than passing interest.

The Insurance Bill.

THE National Insurance Bill has already undergone considerable change as a result of the searching scrutiny to which it has been subjected in Committee of the House of Commons. Some of the clauses in which the medical profession are specially interested have run the gauntlet of this scrutiny, and while at first sight the decisions of the Committee appear to be favourable to the contentions of the profession, we cannot profess to believe that we have gained much or that we are yet out of the wood.

The acceptance of Dr. Addison's amendment to Clause 13, which results in placing the administration of Medical Benefit in the hands of the Health Committee, is eminently satisfactory, and the overwhelming majority of 372 (387 to 15), by which it was carried, leaves no doubt that the Committee was convinced by the arguments of the profession so ably expressed by Dr. Addison. Our satisfaction is considerably modified, however, by the subsequent insertion of a sub-clause at the instance of Mr. Cecil Harmsworth, who appears to voice the views of the Friendly Societies, making special provision for the friendly societies medical aid institutes, and for "any system or organisation existing at the time of the passing of this Act and approved by the Local Health Committee and the Insurance Commissioners." It is evident that the process of watering down has already commenced, and if we may judge by the pronouncements made at various autumn conferences and congresses, the Friendly Societies do not intend to rest content with the matter as it is left by the amended Clause 13. Already there is talk of insisting upon the reversal of the Committee's decision, or, if this is not possible, of circumventing it some way or other. In a Bill of such complexity, and under the guidance of men so astute and experienced in political negotiation as the leaders of the Friendly Societies, we can readily conceive the possibility of amendments, sub-clauses, and other devices so modifying the provisions of Clause 13 as it now stands that its value to the medical profession is nullified.

On the question of the £2 wage limit the Committee did not accept the views of the medical profession, and Dr. Addison's amendment, which was accepted by the Government and carried on a division by 279 to 41, was immediately modified by another amendment, proposed by Mr. Cecil Harmsworth, which has the effect of perpetuating by legal enactment one of the most undesirable forms of contract practice.

In view of what has passed we cannot avoid the conclusion that the contest between the medical profession and the friendly societies is just beginning, and that it is only by constant watchfulness and united action that we can ensure our interests being protected in the Bill. We may be certain that the breathing space afforded by the autumn vacation will be utilised by the Friendly Societies in devising a means of reasserting their position, and we must see to it that their efforts do not go unchecked. There is some danger that a body of men like doctors, whose daily work absorbs so much time and attention, and who are not in the habit of giving much thought to political matters, even when they affect their own calling, may fail to sustain over a prolonged period an active interest even in such a matter as the Insurance Bill, particularly when hostilities appear to be at a standstill, and their enthusiasm is apt to die down when nothing exciting seems to be going on. This we must guard against, and we are confident that those who represent the profession in this matter are watchful, and that they may rely upon the continued support and loyalty of the whole profession in their endeavours to make the Bill acceptable to them and beneficial to the community at large. Until the Bill has emerged in its final form we dare not abate by one jot or tittle our constant vigilance, and even then it will call for our most careful consideration before we decide to accept its provisions.

THE decoration of the Coronation Medal has been conferred on Dr. Allan Jamieson.

AT the annual session of the American Medical Association held in Los Angeles, the House of Delegates, upon nomination by the section on surgery, elected Mr Harold J. Stiles to honorary membership in the Association.

INTESTINAL OBSTRUCTION AND A RECORD OF
ONE YEAR—1910.*

By RUTHERFORD MORISON, M.B., F.R.C.S.,
Professor of Surgery, Durham University.

WHEN your Secretary honoured me with an invitation to read a paper before you it appeared to me impossible to find a more interesting subject than that of intestinal obstruction, for intestinal obstruction still remains one of the abdominal diseases in which surgical progress has made slowest advance, and the reasons are not far to seek. The first probably is that cases are relatively few, and that consequently each individual surgeon requires a long experience and large opportunities before his personal knowledge allows him to arrive at any helpful conclusions; the second that diagnosis is difficult; and the third that uncertainty in diagnosis leads to want of promptitude in action, which in these cases is disastrous in its results.

Notwithstanding all these difficulties some advances have been made, and to those I intend to draw special attention.

For some years I have taught that the diagnosis of intestinal obstruction is based upon a trinity of signs, viz. (1) Spasmodic pain; (2) Inability to pass flatus; and (3) Evidence of increased peristalsis. This symptomatology is based chiefly upon experimental evidence. In the performance of inguinal colostomy, except in cases of emergency, it has been my practice to do the operation in two stages. The first comprises drawing a knuckle of the sigmoid colon through a small opening in the left inguinal region and leaving it there to form adhesions. During the 5 or 6 days which are allowed to elapse the patients are so comfortable that they make no serious complaint. The second stage is accomplished by tying an elastic ligature very tightly round the projecting intestine. The object of this is to avoid the troublesome and sometimes serious bleeding which may follow division of the bowel either by the knife or cauterly. The application of the ligature causes no discomfort, and as a rule nothing is felt for some hours. Then "wind" begins to cause painful rumbling, and the patient frequently perceives that it is arrested at the ligatured spot. If nothing be done at this time all the symptoms of acute obstruction develop in some cases. In all, entire relief is obtained as soon as flatus escapes

* Communicated to the Edinburgh Medico-Chirurgical Society, 7th June.

if a small tube be introduced through an opening in the intestine above the ligature.

With these symptoms and signs the diagnosis of intestinal obstruction due to a mechanical block, for which immediate operation is indicated, is the only sound one, and I almost regret to have to record an exception to this lest anyone should feel inclined by a knowledge of the possibility to counsel delay.

CASE (see Statistics, 1910).—*Paralytic Ileus*.—M. A., aged 35, married woman, was admitted to the Royal Victoria Infirmary, Newcastle-upon-Tyne, on 15/8/10.

She was sent in by her doctor as a case of ruptured gastric ulcer, and I saw her on admission.

There appeared to me to be insufficient evidence upon which to base a diagnosis, and I ordered some palliative treatment and a careful hourly note to be made of her condition. By the following day she appeared to be nearly well, and nothing of a seriously suggestive character remained.

Two days later (17 8 10) my colleague, Mr. Richardson, saw her by request of the house surgeon at 10 o'clock in the morning. He then made a definite diagnosis of intestinal obstruction, but decided, as she had no urgent symptoms, that she should await my arrival. When I saw her at 12 o'clock she was shouting with pain. She had passed no flatus since the attack commenced 8 hours before, though wind belching had been frequent, and on exposing her abdomen violent peristaltic movements were plainly visible and the hardened contracting intestines could be readily felt. Moreover, there was a basin beside her bed containing about 2 quarts of dirty feculent-smelling fluid, which she had recently vomited. Her stomach was washed out and her abdomen immediately opened. No organic obstruction was found. The whole colon was much distended, the small intestine contracted at parts, in others distended. The urine contained about $\frac{1}{4}$ th of albumen. In many previous papers I have directed attention to the fact that organic intestinal obstruction can be simulated by some intestinal disturbance occurring in connection with affection of the kidney, and this condition has more recently been described as enterospasm.

That shock occurring in a case of acute obstruction usually means obstruction plus strangulation, will generally be acceded, but shock may be present without strangulation, and strangulation without shock.

In the cases I have observed of shock without strangulation there has always been free fluid in the abdomen and marked congestion of the intestine above the obstruction, similar to that

found with a strangulation. The most probable conclusion is that the physical cause of shock in these cases is a profound disturbance of the balance between the somatic and splanchnic circulations. That the tendency to shock is largely an individual characteristic is made certain by some of my experiences. One of the most serious instances I have seen of shock following an operation occurred to a nervous young lady on whom I had operated by ligature for hæmorrhoids. One hour after the operation, which was attended and followed by no loss of blood, she became so ill that for 3 hours her condition appeared to be desperate, and her recovery occupied some hours before it was complete enough to relieve our anxiety. This same patient blushed on the smallest provocation, and in other similar instances I have noted marked vasomotor instability.

It is well recognised that in children the most common cause of intestinal obstruction is intussusception. In them the diagnostic symptoms and signs have now become common property, the only proper treatment, immediate operation, is universally recognised, and the results of operation are as good as those of strangulated hernia.

It is not so well recognised that spontaneous reduction frequently occurs—much more frequently I think than the spontaneous reduction of a strangulated hernia. One little girl of 6 whom I saw in the country is one of the most striking examples of this. At my visit I found her suffering from intussusception and advised her immediate removal to the infirmary. As on her arrival there we found that all her symptoms had vanished, and along with them the tumour, I refrained from operating and she promptly recovered. Her parents, exceptionally intelligent people, were told when she was sent home to return at once if there was any recurrence of her symptoms. Within one year she was sent back three times with recurrence of her symptoms, but was either well on her arrival, or became so shortly afterwards. The day after her last admission she was entirely free from symptoms, and I opened her abdomen with the object of preventing further attacks. The operation confirmed the diagnosis, for the ileum close to the ileo-cæcal valve showed obvious damage as of recent strangulation, and plecting the mesentery sufficed to prevent return of her seizures. Another point which must be emphasised is that whether the intussusception is acute or chronic depends upon whether the intussuscepted portion of gut is or is not firmly

strangulated. The chronic variety may be called a disease of adults, and the acute, one of children, but there are exceptions to both statements.

CASE.—Chronic Intussusception in a Child.—A male child, aged 3½ years, a patient of Dr. Burnell, was admitted to a private hospital on 7th March 1909.

History. His illness was of 10 days' duration. It began with pain and vomiting after eating an orange. After 2 days the active symptoms ceased, but he occasionally vomited and had spasmodic pains coming on at intervals until the last 6 days, when there was no sickness. His bowels had been moved for the last four days, but for the first time since his attack the night before admission blood was noticed in the stools. He had eaten little during the illness and had been maintained on fluid foods. From the first Dr. Burnell had been able to feel a tumour under the upper part of the right rectus muscle, but his diagnosis of intussusception was rejected by an eminent physician who was called in consultation.

On admission the child looked ill but not dangerously so. His tongue was dry and covered with a white fur: temperature, 98° F.: pulse, 130.

His abdomen was slightly distended and a definite elongated tumour could be felt under the upper part of the left rectus muscle immediately below the costal margin. During the examination visible peristalsis and audible rumbling developed, and the tumour was felt to harden during an attack of pain.

I confirmed Dr. Burnell's diagnosis of intussusception and operated.

The abdomen was opened through the right rectus muscle over the tumour, when it was found that the end of the ileum and appendix and cecum, inverted into the ascending colon, formed the tumour which had been felt. Reduction was readily effected, and except for some oedema the gut appeared to be undamaged. Recovery was uneventful.

In adults chronic intussusception is more common than in children, but it is rare, and the diagnosis is still more difficult. It has been said that the definite sausage-shaped tumour alternately hardening with the pain and relaxing in the interval is pathognomonic, but the following case proves that even this sign may mislead.

CASE.—Malignant Stricture of Ascending Colon simulating Chronic Intussusception.—A widow, aged 81, was admitted to a private hospital, 10th November 1908.

History.—Two years before admission she had several sharp attacks of abdominal pain with wind rumblings. Little importance was

attached to them and she soon got quite well. One year later she had a repetition of similar attacks. The rumblings were then loud and with them there came a visible swelling in the right lower abdomen. She was often sick with the attacks, but the vomited matter had no bad smell. Vomiting relieved her pain, and she soon felt all right after a good clearance. Then followed 10 months of freedom from trouble, but during the last 2 months her pain had returned and she had got thinner. Nothing wrong was noticed with the stools—no diarrhœa, blood, or slime.

On admission her general condition was fair. Temperature, 98.2 F.: pulse, 86; arteries, elastic. On examining the abdomen at first nothing was seen or felt. During the examination some rumbling occurred and marked peristalsis became visible and palpable. A large sausage-shaped tumour then formed on the right side, reaching from the pelvis below, filling the right flank, and extending up to the right costal margin. The tumour became quickly very hard, and above and below a rounded well-defined edge could be mapped out. It could be moved from side to side, not so freely from above downwards, and very slightly with respiration. After less than 1 minute the swelling disappeared with a gurgle and the abdomen was as before.

There were no signs of disease anywhere else. The diagnosis made was chronic intussusception.

Operation, 17th November 1908.—The abdomen was opened by an oblique incision commencing in the right iliac fossa and extending back towards the loin. The cæcum and ascending colon presented, and on the latter there was a characteristic annular malignant growth causing a marked stricture about 5 ins. from the end of the cæcum. The terminal 5 ins. of the ileum, the ascending colon, and the ileo-colic lymph area were excised, the divided end of the colon was sutured, and the distended reddened ileum was brought out of the wound and tied to a Paul's tube for temporary enterostomy.

Second operation, 30th December 1908.—The fæcal fistula was temporarily closed with sutures and the wound was reopened. A further portion of the ileum was removed and a lateral anastomosis made with the colon above its closed end. Good recovery. Death occurred 1 year later. There was no post-mortem examination.

The fact that intestinal growths usually accompany adult intussusception is illustrated by the relation of my cases.

The next condition of which I wish to say something is *volvulus*.

It is a very important one, one quite frequently overlooked, and one concerning which there is much loose writing and thought.

In my recent book (*An Introduction to Surgery*) I have divided

volvulus into two varieties, primary and secondary. The following is a good example of one of the primary forms:—

CASE.—Complete Volvulus—Four Operations—Radical Cure.—A miner, aged 15, was admitted to the Royal Victoria Infirmary, Newcastle, on 21/10/09.

History.—Three times previously he had been in the institution—1/2/08, the 18/3/08, the 14/10/08—and had been operated upon for acute intestinal obstruction due to a complete volvulus. The notes show that on each occasion it had been necessary to eviscerate him to reduce the twist, and the distended cæcum was always found near the spleen.

On the last occasion (30th October 1909), after reducing the volvulus, I attached his cæcum in the right iliac fossa and his ascending colon by a series of sutures in the right flank. Each suture of silk passed through the outer coats of the bowel and out through the parietes and was fastened there over a dossil of gauze.

4/6/11.—Patient has had no attack since the last operation, and is “stronger and better than ever before.”

The secondary form is illustrated by Case 3 and Case 9 (pp. 9, 12) in last year's series. They also demonstrate a fact not sufficiently recognised, but true of all twists, that it takes several attacks and often many twists to cause gangrene and death.

Colon.—The diagnosis of growths in the large intestine is full of interest and surprises which may be unpleasant and dangerous.

Beginning at the cæcum, either a malignant or tuberculous tumour, by interfering with the ileo-cæcal opening, may cause “attacks of pain,” and the discovery of a lump, in the majority of cases, suggests appendicitis. It requires careful consideration of the history and of the physical signs if this error is to be avoided, and with both of these it is possible to make a mistake. More than once I have opened an abscess in the right iliac fossa expecting to remove the appendix and have found a perforating malignant ulcer of the cæcum, and more than once, expecting to remove the cæcum for cancer, I have found appendicitis and an old abscess (Case 39).

In women a large ileo-cæcal tumour due to cancer or tuberculosis is usually thought to be an ovarian tumour till the abdomen is opened, and if the operator should chance to be a specialist in gynaecology the predicament is awkward for his patient and for himself.

I have already mentioned and quoted a case in support of

the statement that an annular stricture of the ascending colon immediately above the caecum causes a sausage-shaped tumour, with an upper end the stricture and a lower the end of the caecum, which hardens when distended (the ileo-caecal valve being competent) and relaxes when empty, accurately simulating the tumour of an intussusception.

Higher in the ascending colon a malignant growth resembles very closely a tumour of the kidney (Case 23).

At the hepatic flexure a growth resembles closely one of the gall-bladder (Case 24).

In the transverse colon it is not seldom taken to be cancer of the stomach, and I have seen this error made by a most distinguished surgeon.

In the descending colon, again, the kidney or the spleen may be suspected, and in the sigmoid flexure there is another trap for the gynaecologists, who, finding a hard painful lump in Douglas's pouch, mistake it for a diseased and prolapsed ovary.

Two of the recent additions to diagnosis of growth in the large intestine and stricture are the sigmoidoscope for those just out of reach of the finger, and bismuth injections with X-ray pictures to show stricture anywhere in the colon. The value of the sigmoidoscope is universally conceded, that of bismuth injections is not so well known. Recently at the clinic of Professor Tuffier in Paris I saw X-ray pictures showing stricture of all parts of the colon so clearly that no mistake was possible.

Treatment of Intestinal Obstruction.—It is as true to-day as it was ten years ago, when I wrote the article for the *Encyclopaedia Medica* on operative treatment, that "In cases of acute intestinal obstruction the sooner operation can be performed the better the prognosis," and it is unlikely that this will ever prove other than the best guide.

Since then I have emphasised this view by figures which support it so strongly as to bear repetition. Besides other evidence* the following occurs:—"During the past 3 years, from 1900 up to date, the registrar has found a note of 11 patients who were attacked (in hospital) by acute intestinal obstruction whilst under my care and suffering from other conditions. Of these 9 recovered and 2 died. One death occurred in a patient who was not operated upon from mistaken diagnosis. Of 10 patients operated upon 9 recovered and 1 died. The patient who died

* See an address on the "Treatment of Abdominal Emergencies," *Lancet*, 31st January 1905.

was a young man whose appendix had been removed two days previously, and who developed a complicated volvulus involving the small intestine."

That early operation is only done now when a definite diagnosis can be made by physician and practitioners is certain, and it is the surgeons chiefly who must teach how this is to be done, as well as its importance. If anyone doubts the truth of this let him consider the results now as compared with those of twenty years ago in cases of intussusception. Early diagnosis and prompt operation have converted this deadly complaint into one almost devoid of risk.

So soon as physicians teach that every patient with more than ordinary abdominal pain must at once be removed to a properly equipped hospital for observation and treatment the mortality from abdominal emergencies will drop more than 50 per cent. Every surgeon knows that these emergency operations are usually easy, that the operations from the surgical point of view are safe, and that their mortality, still dreadful, is the result of delay and not of surgical difficulties.

It is not *always* possible to make a correct differential diagnosis in these cases, and, humiliating as the position is, it is of the first importance that it should be accepted and acted upon.

My own practice for years in doubtful cases has been, first to have the stomach washed out by tube. I have converted thus a mere suspicion into a certainty by finding feculent contents in the stomach of a patient who had never vomited. The next is to administer a large dose of castor oil and later an enema. The effect of this in intestinal obstruction is to stir the intestine up to activity and often to make the diagnosis definite. Then operation is undertaken at once. It is not always possible to say that a case is certainly one of intestinal obstruction, still less to say where the block is and of what nature; but if a complete diagnosis can be made the surgical treatment becomes safer and easier because the abdomen can be opened directly over the site of the lesion. With regard to the operation I can add little to what I wrote in the *Encyclopedia of Medicine and Surgery* (vol. iv.), but would like to reiterate as to the importance of a carefully carried out scheme in exploratory operations, and to emphasise the danger of allowing the intestines to escape from the abdominal cavity in these obstruction cases. If the assistant is given to understand that his chief duty, and one he must not neglect for any other, is to keep the intestines confined within

the abdomen, the mortality following operations for acute obstruction will be considerably diminished. Another point concerns the treatment of distended intestines. If these can be kept within the abdomen no fears need be entertained for them; if they escape it is necessary to provide for their artificial relief from distension. I do not trust multiple incisions or rapid emptying through a tube, but prefer to leave a tube in and do an enterostomy. If a little care is taken with this the faecal fistula resulting ought to close spontaneously. The care required is to place a purse-string suture round the intestinal opening and after passing a tube into the intestine to tighten up the suture and *to tuck in the intestinal coats round the tube* so that no mucous membrane projects and a fistula lined by peritoneum is left when the tube is taken away. It is fortunately becoming rare now to see cases left so long as was the custom only ten years ago, but for a patient very ill with a tense distended abdomen the best chance I still believe is given by a simple enterostomy. The greatest addition to the radical surgery of obstruction in the small intestine has been made by Professor A. E. Barker (see *Lancet*, 17th September 1904), who advocates excision of a considerable length of distended bowel above the obstruction (see Cases 7 and 10).

Where the obstruction, even though acute, is due to block of the large intestine, complete exploration may be made with impunity. In these cases all surgeons are now agreed that no attempt should be made to do a radical operation till after obstruction is relieved. A radical cure then means three operations—one for drainage, the second to remove the growth, and the third to close the drainage opening, unless this is made in such a position as to be removable with the growth (Case 29), which, I think, is undesirable, or is made valvular so that it may close spontaneously. The exploration allows of a choice of sites for the colostomy, and in inoperable cases this will be made as low down as possible. Where it is decided that a radical cure should be attempted I prefer caecostomy, because it is most easily done, is away from the future site of operation, and the opening can be readily and safely closed when no longer needed.

With regard to the "radical" operation, I would like to say that in my view the ideal one is suggested by the excellent work of Jamieson and Dobson on the colon lymphatics, and I feel no doubt that this is the standard we should keep before us. There has been a larger mortality in my cases than I could have wished, but all new operative methods pass almost insensibly from this

stage into others of greater and greater success as experience of them increases, and none of us can say exactly why or what has made the difference. Though a high standard should be set, it must not be allowed to dominate the judgment in individual instances. Experience has proved that in a considerable percentage of cases permanent cure has followed much more limited excisions than are suggested, and this knowledge must be used for the benefit of patients judged to be unlikely to do well after the more formidable undertakings. At the same time it should be remembered that mobilisation of the colon by division of the outer and upper peritoneal layer of its mesentery has made dangerous operations safe and difficult ones easy. In addition to the possibilities of doing all excision and suture work outside of the abdomen it has made the blood-supply visible and made lateral anastomosis, which I still think the best form of junction, suitable to any part of the colon. In mentioning anastomosis I have to confess that I think it may *sometimes* be made more satisfactorily by an apparatus than by simple suture, and I am not above availing myself of the help of the most ingenious of such devices, the Murphy button. Instead of this, when time has been an important factor, I have used a simple glass bobbin (Fig. 1), and in the notes of one of my two reported cases I find that with this the anastomosis was made in 5 minutes, and that both patients recovered. The other apparatus to which I wish to draw your attention (Fig. 2) was described in a paper read before the Gynaecological Society of London and published in the *British Gynaecological Journal* of February 1901. It was designed to deal with those difficult cases of growth in the pelvic colon too low down to be dealt with in the ordinary way from above and too high to be accessible from below. It was used in 4 of my cases last year, with 3 recoveries and 1 death, and should, I think, be better known. In one of my cases operated upon some years ago a stricture followed its use, but this appeared to result from prolonged sepsis. I know of nothing else against this method.

In operable cases an anastomosis has so many advantages over permanent colostomy that it is a duty to perform it when possible. Within the last year I visited the operating theatre of a colleague and found him engaged in joining the ileum to the transverse colon in a case of inoperable cancerous stricture of the hepatic flexure. He did not know or could not believe that if his operation were successful and the ileo-caecal valve competent the

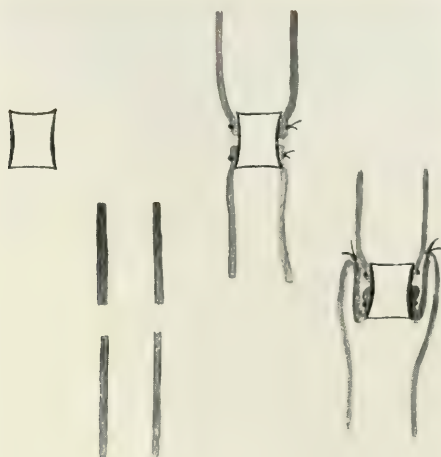


FIG. 1. GLASS ANASTOMOSIS BOBBIN.

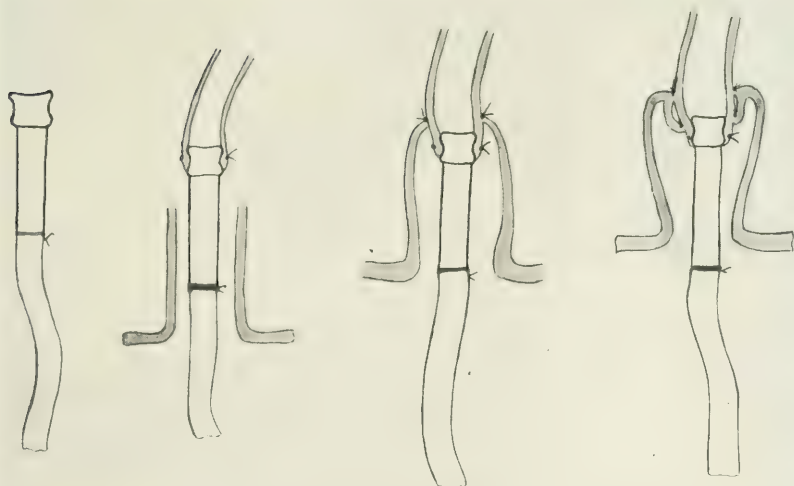


FIG. 2.—GLASS ANASTOMOSIS BOBBIN WITH INDIA-RUBBER TUBE.

Steps of Operation.

1. Tie Glass Bobbin and India-Rubber Tube into the upper end of the divided sigmoid.
2. Take hold of outer wall of lower bowel with four catch forceps half-an-inch from its cut end.
3. Pass a solid bougie with thick silk ligature tied to its end into the lower bowel from above and out through anus. The silk ligature is to draw through a bunch of iodoform gauze followed by the india-rubber tube.
4. Pull on the india-rubber tube till the glass bobbin is entirely within the lower bowel.
5. With the aid of the fixation forceps double the lower cut end downwards (invert) and fix it there with two rows of suture.

cæcum would burst, though I have taught this for at least 15 years. If I have performed this anastomosis, at the same time I have done a "pyloroplasty" on the valve.

In connection with these desultory remarks I am giving the statistics of all my operations for intestinal obstruction, active or potential, for 1910, and abstract notes of every case. They illustrate every point I have endeavoured to make, and fill up many gaps. The notes have been supplied by the Surgical Registrar, Mr. Willan, and edited by Mr. Saint, to whom I am under great obligations. It may add to their interest that with each case the pre-operative and post-operative diagnosis have been given. For many years it has been my rule that *one* definite diagnosis should be made and written down before operation, and I have found this a very healthy stimulus, for in the great majority it is my own opinion that is recorded. It may also interest many to find that surgeons are not *always* right, and to suggest after careful perusal of the notes how they may have gone wrong.

Before concluding I would like to quote the final words of a clinical lecture of mine given in the Royal Victoria Infirmary on 10th June 1909. "The results in cases of acute obstruction of the small intestine are little, if any, better than they were twenty years ago: whereas the results in chronic obstruction, especially affecting the large intestine, have enormously improved. Why is this? It is because operative *technique* has made such strides during that time, and operative skill has a considerable influence on the statistics of colon obstruction. Operations for colon obstruction mostly require the difficult operation of resection for their radical cure, and this has been perfected during that time. But operations for the radical cure of small intestine obstruction have not been influenced much, if at all, by surgical progress. They are nearly all simple—*c.g.* the division of a band, the separation of adhesions, or the withdrawal of a strangulated loop, and these could be done as successfully twenty years ago as they can be now.

"The lesson we learn is, that early diagnosis and immediate operation are of far greater importance than operative skill, and no improvement in results can be expected until this has been acknowledged and acted upon. Then patients will recover from acute intestinal obstruction as they now recover after operations for strangulated hernia."

STATISTICS.

OPERATIONS FOR CASES OF INTESTINAL OBSTRUCTION DURING 1910.

ACUTE :

- | | |
|----------------------------|--|
| I. NO MECHANICAL AGENCY. | 1. Paralytic ileus—albumen in the urine. |
| | 2. Paralytic ileus in a case of phthisis—nothing in abdomen. |
| II. KINK—NO STRANGULATION. | 3. Adhesion from old appendix, with secondary volvulus—freeing and cure of hernia. Second operation, acute kink—death. |
| | 4. Appendix on left side of spine—acute kink—44 ins. resection. |
| | 5. Adhesions from old appendix—kink not acute—intestinal obstruction. |
| | 6. Interval appendix—kink from numerous adhesions, not acute. |
| III. STRANGULATION. | 7. Strangulation under a band—symptoms less than expected. |
| | 8. By band, in association with old appendix abscess. |
| | 9. Adhesions in pelvis, with volvulus (secondary) after puerperal sepsis. |
| | 10. Strangulation of loop by Meckel ; Meckel gangrenous. |
| | 11. Stricture after strangulated femoral hernia—fistula present. |
| | 12. Fistula in strangulated ventral hernia after appendix ; 9 ft. resection. |
| IV. LARGE BOWEL. | 13. Inoperable carcinoma of ileo-cæcal valve. |
| | 14. Carcinoma of ascending colon, immediately above cæcum, with ovarian cyst. |

CHRONIC :

- | | |
|------------------------------|---|
| I. ADENOMATOUS POLYPUS. | 15. Small intestine, with chronic intussusception. |
| | 16. Sigmoid—case previously treated for mucous colitis. |
| II. ILEO-CÆCAL TUBERCULOSIS. | 17. Diagnosed chronic appendix abscess—
1. Excision of mass and enterostomy.
2. Acute obstruction relieved. 3. Lateral anastomosis and closure. |
| | 18. Old operation for appendix ?—fistula—Jamieson-Dobson. |
| | 19. Tubercle and chronic appendix—excision, not Jamieson-Dobson. |
| | 20. Tubercle ?—1. Lateral anastomosis. 2. Jamieson-Dobson. |

III. CARCINOMA.

21. Caput caeci—intussuscepted into ascending colon—Jamieson-Dobson.
22. Ascending colon—about middle—Jamieson-Dobson—death from dilatation of stomach.
23. Ascending colon—practically no bowel symptoms—diagnosed kidney.
24. Hepatic flexure—spreading from gall-bladder by adhesion.
25. Transverse colon—excision and lateral anastomosis.
26. Splenic flexure—inoperable, permanent colostomy.
27. Sigmoid flexure—1. Cæcostomy. 2. Excision and left colostomy. 3. Closure of cæcostomy.
28. Sigmoid flexure—excision and permanent colostomy.
29. Sigmoid flexure—1. Sigmoidostomy. 2. Excision and telescoping ends.
30. Sigmoid flexure—typical history—excision and end-to-end telescoping.
31. Sigmoid flexure—diagnosed “primary ovarian.” Pathologist “primary bowel.”
32. Sigmoid flexure—complicated by vesicocolic fistula.

POTENTIAL:

33. Multiple polypi of rectum—colostomy.
34. Multiple polypi of colon, from middle of transverse to the rectum, associated with ulceration—cæcostomy—death.
35. Sigmoido-vesical fistula—sacculitis and perforation.
36. Gastro-colic fistula—carcinoma of stomach, inoperable.
37. Recto-vaginal fistula—secondary peritoneal deposits, reported cancer.

DIFFERENTIAL DIAGNOSIS:

38. Perforated duodenal ulcer, three days' duration, with general peritonitis; admitted with retention of urine and paralytic ileus. Diagnosed obstruction.
39. Old appendix abscess—diagnosed ileo-cæcal carcinoma.

Of the total number of cases operated on for intestinal obstruction, viz. 39, there were 10 deaths, *i.e.* 25·7 per cent.

Of cases in which resection of gut was performed—20 in number—4 died, *i.e.* 20 per cent. A detailed list of these is given in tabular form.

CASES IN WHICH RESECTION OF GUT WAS PERFORMED.

Bowel.	Case No.	Sex.	Age.	Disease.	Operation.	Recovery or Death.	Cause of Death — if died.
SMALL.	4	M	33	Kinking from appendix	Excision of 44 ins.	R	...
	7	F	12	Strangulation under band	" 2 ft.	R	..
	10	M	24	Strangulation due to Meckel	" 3 ft.	R	...
	12	F	50	Fistula with strangulated ventral hernia	" 9 ft.	R	...
LARGE — <i>Acute</i>	11	F	62	Carcinoma of ascending colon	Jamieson-Dobson	D	Shock — enterostomy did not act
	16	M	58	Malignant papilloma of sigmoid	Excision of bowel involved	R	..
	17	M	30	Ileo-cæcal tuberculosis	Excision, &c. — 3 operations	R	...
	18	F	20	Ileo-cæcal tuberculosis	Jamieson-Dobson	R	...
	19	M	48	Ileo-cæcal tuberculosis	Excision	R	...
	20	M	18	Ileo-cæcal tuberculosis	Jamieson-Dobson — 2 operations	R	...
	21	F	64	Carcinoma of caput cæci	Jamieson-Dobson	R	...
	22	M	43	Carcinoma of ascending colon	"	D	Acute dilatation of stomach
	23	M	59	Carcinoma of ascending colon	"	D	Anastomosis given way; acute dilatation of stomach
	25	F	44	Carcinoma of transverse colon	Excision and lateral anastomosis	R	..
	27	M	62	Carcinoma of sigmoid colon	Excision and colostomy — 3 operations	R	...
	28	F	64	Carcinoma of sigmoid colon	Excision and colostomy — 1 operation	R	..
	29	F	75	Carcinoma of sigmoid colon	Excision — 2 operations	D	Mania, 18 days later
	30	F	42	Carcinoma of sigmoid colon	Excision — 1 operation	R	..
	31	F	45	Carcinoma of sigmoid colon	Resection of 4 ins. of adherent infiltrated small gut	R	..
	33	F	61	Sigmoido-vesical fistula	Resection of adherent sigmoid and ileum — 9 ins.	R	...

CASE 2.—*Paralytic Ileus*.—A man, aged 26, was admitted to the medical side, Royal Victoria Infirmary, for the treatment of pulmonary phthisis, 1/6/10.

On 20/8/10 I was asked to operate upon him for intestinal obstruction of a few days' duration. On opening the abdomen nothing was found to account for his symptoms. He recovered promptly from the operation, had no further abdominal trouble, and was transferred back to the medical house.

CASE 3. — *Congenital Inguinal Hernia—Secondary Volvulus due to Adhesions from Appendicitis—Operation—Recovery. Second Operation for Intestinal Obstruction—Due to Adhesions—Death.*—J. C., aged 30. Admitted 18/2/10. Discharged 7/3/10. Readmitted 30/4/10. Died same day.

Patient had had a rupture as long as he could remember. He had never had any difficulty with the reduction of it. He had occasionally had some discomfort when it increased in size, but no vomiting or stoppage in the bowels, and was always relieved by reduction of the mass. Eighteen months ago the patient was seized with intermittent abdominal pain, gradually increasing in severity, accompanied by vomiting, constipation, and inability to pass flatus, while at the same time he noticed lumps rising in the belly with the pains and disappearing again; there was slight rumbling with the onset, but it was not present later. He described his feelings as though there were some wind which wanted to break away. The pain passed off quite as quickly as it came on, and with the first attacks he felt all right after they had subsided. The first attacks were relieved by enemata, but not the last. He had had in all 5 such attacks, coming on at varying times of the day, the last, a week ago, the worst he had had. It was unrelieved by enemata and made worse by aperient medicine; it lasted for 8 hours. Usually his stools consisted for the most part of small hard fecal masses, and he said he had noticed flattening of the motion. He had had no alternating diarrhoea and constipation, and only once, 1½ hours after onset of attack, he had some increase in the frequency of his stools; with these attacks he had had no pain in his rupture, and had had no irreducibility of it, the swelling being easily returned to the abdomen.

On admission the patient was in fairly good general condition; temperature and pulse normal; chest clear.

Local.—He had a right complete reducible inguinal hernia with a congenital sac; nothing abnormal felt in his abdomen. Per rectum, nothing abnormal palpated.

Diagnosis.—Right reducible congenital inguinal hernia, with a volvulus of the lower ileum, probably due to adhesions resulting from a previous attack of strangulation in the hernia, the adhesions thus being in the right iliac fossa.

Operation—22/2/10. *Mr. Morison.*—Oblique incision in lower part of right iliac region, parallel to Poupart; abdomen opened. Adhesion found extending from the appendix to a piece of the ileum at its lower part. A tuberculous gland was situated in the mesentery of the ileum just beneath the attachment of the adhesion from the appendix. There was a well-marked scar on the wall of the ileum, resulting from a twist of the gut from left to right, evidently due to the adhesion. The mesentery also of that part of the ileum, which had been twisted,

was hard and fibrous, like an ovarian pedicle that had undergone torsion.

The adhesion was separated and the tuberculous gland, the size of a small nut, was removed; the appendix was also removed and the stump buried—it was internal and posterior to the cæcum, pointing towards the pelvis. The original skin incision was extended and a radical cure of the hernia performed in a modified Halsted-Kocher method. The sac was thin and contained no gut, but the testicle, only partially descended, was lying at the bottom of it. Belly wall closed in layers.

Microscopic Report of Gland.—Small lymph gland infiltrated with lime salts and showing diffuse fibrosis; some caseation is present, but no giant cells, though the condition is probably old tuberculosis.

7/3/10.—Uninterrupted recovery. Left hospital all healed.

Readmitted 30/4/10 with intestinal obstruction of 3 days' duration; he was very ill on arrival, with belly tense and distended, and pulse 140.

Operation—30/4/10. *Mr. Morison.*—Median infra-umbilical incision; abdomen opened. Numerous adhesions found in ileo-cæcal region. Those which appeared to be giving rise, by kinking, to the obstruction were separated and the bowel freed. Belly closed.

On return to the ward patient collapsed and died in the afternoon.

Post Mortem.—Nothing found, except other adhesions in ileo-cæcal region, fairly widespread. Death from exhaustion due to delayed operation.

CASE 4.—Erratic Appendix—Appendix Abscess on Left Side causing Intestinal Obstruction—Resection of 44 ins. of Damaged Intestine—Recovery.—J. K., aged 33, overman. Admitted 7/1/10. Discharged 11/2/10.

Three days ago patient developed a pain in his abdomen, more marked on his left side; it came on about 2 P.M. while he was outside. He thought it was wind and stayed out till evening. It was intermittent, but increasing in severity, and as it became worse it became practically continuous. At night he took some aperient and an hour or two later vomited for the first time. The aperient was repeated the following morning and vomiting again occurred. Since this he had vomited frequently and the later vomitus had been faecal. There had been some, but not marked, rumbling in his abdomen, and he had belched up a great deal of wind. He had not had his bowels moved of themselves and at first there was complete arrest of flatus. He had had 3 enemata, each 3 pints, giving rise to very little result, though the last two were returned accompanied by a great deal of flatus, which relieved the distension that had occurred. Since this he had been much easier, that is, for the last 24 hours.

On admission patient looked somewhat worn out, features drawn and sunken; tongue, dirty brown fur; temperature, 98°; pulse, 98; chest, clear. Vomited a little after admission, vomited matter somewhat foul-smelling.

Local.—Abdomen distended, but quite lax; some tenderness to the left of the mid-line, but no rigidity; distension was in front and not in the flanks; no free fluid made out; peristalsis, very little, at times a slight change in the contour of the abdomen; no hernia present; urine contained albumen $\frac{1}{2}$. For this reason operation was negatived, the suggestion offered by the surgeon called in being that of paralytic ileus due to kidney disease. Mist. purg. alb. \mathfrak{ss} . every hour was ordered; bowels were moved twice before morning. 9-15 A.M., patient still feeling sick, but no more vomiting. Patient was transferred to the medical wards.

28/1/10.—Seen by Mr. Morison; patient had been having considerable pain in the abdomen, intermittent and cramping, associated with sickness, suggestive of some partial obstruction.

Local.—A mass was felt on deep palpation to the left of the umbilicus, about the region of the duodeno-jejunal junction; tender on palpation, indefinite in shape.

Diagnosis offered.—Tuberculous glands in the mesentery causing adhesions and intestinal obstruction. Urine now contained no albumen and none had been present for some time.

Operation—29/1/10. *Mr. Morison.*—Abdomen opened through the left rectus sheath, the muscle being displaced outwards. On exploring the small intestine with the finger a portion was arrived at which was adherent in two distinct puckered places to the mesentery on the left of the spine—these coils were reddened, œdematous, and covered with yellow lymph. On separating them an old abscess cavity without pus was exposed between the intestine and posterior abdominal wall. At the bottom of this cavity was seen what looked like an enlarged gland, but which, on pulling up and separating, proved to be the bulbous tip of the appendix. After fully separating it it was found to run behind the lower ileum to its caecal attachment; it was removed in the usual way and the stump inverted by purse-string suture. The mesentery of the released gut and the gut itself were deemed too much damaged to leave, so 44 ins. were resected. The bowel was divided by the thermo-cautery between clamps; the two ends were closed by through-and-through catgut and overlying Lembert's of silk. A lateral anastomosis was now performed by simple suture. A mass of enlarged glands was palpated in the mesentery, but these were not interfered with. Belly wall closed in layers. Patient was transfused to the extent of 35 ozs. of saline during the operation.

Specimen.—Appendix was thickened and œdematous, especially the mucous membrane, which was very thick and grayish-looking. No per-

foration detected. Mr. Morison thought it might be tuberculous and that the enlarged mesenteric glands were either of this nature or septic. On examination of the intestine resected a perforation was discovered—not the result of accident during the separation. This Mr. Morison considered to be the site at which the abscess, previously existing, had discharged itself. If the gut had not been resected this opening would have been missed and leakage would have followed the operation.

Microscopic Report of Appendix—3/1739.—Chronic inflammatory thickening of submucous and peritoneal coats—no evidence of tuberculosis.

11/2/10.—Patient made an absolutely straightforward recovery. He is now well; bowels acting all right and he is eating solid food; wound healed; left hospital. Three months later returned for inspection; wound excellent; has put on about 1½ stones in weight; bowels have acted every day since his discharge.

CASE 5. — *Intestinal Obstruction due to Kinking from Adhesions following Appendicectomy*.—H. J., aged 43, cartman. Admitted 2/2/10. Discharged 21/2/10.

Patient was admitted complaining of severe abdominal pain.

Six and a half years previously he had his appendix removed; at the operation the omentum looked as though it were becoming gangrenous, but it was not interfered with; there was no abscess. The appendix was acutely inflamed but not perforated.

For the first 3 years he was quite well, but subsequently he was troubled with attacks of pain at intervals. The day before his admission, while at work, he was seized with sudden severe pain in the region of the umbilicus. It passed off towards night, but returned with increased severity next morning, at about 7 A.M., and after this became worse. He had no vomiting with it, and his bowels had been quite regular, being moved in the morning before the onset. He was able to pass flatus. There had been no pain with micturition.

On admission he was in very good general condition; temperature, 99°; pulse, 61.

Local.—He was tender in the umbilical region, and there was some resistance to examination, indefinite in character. He was quite resonant all over, and no tumour was felt. No peristalsis was visible.

Diagnosis.—*Intestinal obstruction?*

Operation—12/2/10. *Mr. Morison*.—Median laparotomy performed, excising the umbilicus. On opening the abdomen and exploring the ileo-cæcal region the last part of the ileum was found adherent by its antimesenteric border to its own mesentery, thus producing a distinct kink. The adhesion was separated. The old appendix site was examined and found to be an excellent result. Abdominal wound closed in layers.

21/2/10.—Patient made an uninterrupted recovery and left hospital, the wound having healed by first intention.

CASE 6.—*Intestinal Obstruction from Adhesions and Kinking following Appendicectomy.*—A single girl, aged 25, was admitted to the Royal Infirmary, 9/7/10.

History.—Fifteen months previously her appendix and right ovary had been removed at home for what she had been told was appendicitis. For six months after the operation she was quite well, when she began to have pain in her right side, accompanied by rumblings loud enough for those in the room to hear, and relieved by the passage of flatus. Her bowels were constipated and her appetite poor, but she was not getting any thinner.

On admission the patient was a spare woman in fair health.

The abdomen showed an old scar over the linea semilunaris and below the umbilicus. At its upper end there was some rigidity of the muscles, with a tender resistant area underlying it.

Diagnosis.—Ileo-cæcal tuberculosis.

Operation—13/7/10.—The abdomen was opened by an oblique incision in the right iliac fossa. Fluid escaped. There were numerous firm adhesions around the cæcum and lower ileum which were divided by scissors between clips. After freeing the bowel the abdomen was closed. Recovery.

CASE 7.—*Strangulation of Intestine under a Tight Band due to Tubercle—Resection of 2 ft. of Small Intestine.*—A schoolgirl, aged 12, was admitted to the Royal Victoria Infirmary, 4/11/10.

History.—She was quite well till 3 days ago (1st November). On that day, on her return from school, she was seized with a pain in her stomach which made her feel sick and vomit. The pain soon became intermittent in character, and continued till her admission. It had never been sufficient to make her shout or to keep her awake. There had been rumbling of wind in the bowels, but no flatus had passed since the attack commenced. Any food produced pain and vomiting at once, and the sickness entirely relieved the pain. The vomited matter was only the food she had taken; there was no bile nor blood in it. Her bowels were slightly moved after an enema the night before admission. There was no blood in the motion.

On admission she looked somewhat pinched, but had a good colour, and did not appear to be seriously ill. Temperature, 99·4°; pulse, 126.

The abdomen was distended and tympanitic except in the flanks, where there was shifting dulness. An indefinite tender mass could be felt in the right iliac and flank region.

Nothing was discovered per rectum, and the examining finger was not blood-stained.

Diagnosis.—Subacute intussusception.

Operation.—The abdomen was opened in the mid-line by excising the umbilicus. Some clear serous fluid escaped, and a deeply congested loop of strangulated intestine presented. The tumour was discovered in the right flank, and was turned out on to the abdominal wall. It was then seen to be composed of a bunch of strangulated gangrenous intestine which had passed through a cord-like ring of adhesion not bigger than a wedding ring. Two feet of small intestine immediately above the ileo-cæcal valve, half of it strangulated as described, were excised. In making the separation a tuberculous gland to which the adhesion was attached was accidentally opened. Its contents were scooped out and the capsule was seared with a thermo-cautery. The divided intestinal ends were then closed, a lateral anastomosis by two layers of sutures made between the ileum and cæcum and the abdomen was closed in three layers without drainage. Recovery.

CASE 8.—*Intestinal Obstruction from Band due to old Appendix Abscess.*—A schoolboy, aged 13, admitted to Royal Victoria Infirmary 30/5/10.

History.—For 3 years the patient had been subject to recurrent attacks of abdominal pain. It came on quite suddenly, was of a stabling character, and diffused over the whole abdomen. Vomiting of yellow fluid, which did not relieve the pain, was always present, and he could neither pass fæces nor flatus. The attack was always removed by the passage of flatus.

On admission he was an emaciated weedy-looking boy. Pulse, 96; temperature, 100° F.

Abdomen.—Nothing could be felt from above. The rectum was ballooned. Anteriorly a hard mass could be felt between it and the base of the bladder like an inflammatory exudate.

Diagnosis.—Intestinal obstruction due to tuberculous adhesions.

Operation—31/5/10.—The abdomen was opened in the middle line after excision of the umbilicus. An adherent strangulated coil of obstructed small intestine was found in the right iliac fossa with a band surrounding it. The intestine above was much enlarged and hypertrophied, below it was small and contracted. It was freed from the adhesions, exposing the remains of an abscess which was traced to the vermiform appendix. The raw surface of the intestine was sutured, and the appendix, which was adherent in the pelvis, was excised. There were several tuberculous glands in the mesentery of the small intestine, but these had nothing to do with the present condition. The abdomen was closed in layers. The appendix contained pus, and had a stricture at the cæcal end. Recovered.

CASE 9.—*Subacute Intestinal Obstruction from Adhesions following*

Puerperal Sepsis—Acute Termination due to Secondary Volvulus.—M. J. B., aged 28. Admitted 27/1/10. Died 3/2/10.

Pain.—Four days before admission the patient was awakened at 5 A.M. with cramping pain in the abdomen, which gradually increased in severity; it was intermittent in character, and relieved by pressure. She vomited repeatedly everything she took, and also between the periods of taking food, at first bile, and later dark-brown fetid material—this had continued. The vomiting relieved the pain for a short time. Rumbling was present, quite loud and audible, whenever the pain came on severely.

Arrest of Flatus.—Since the onset she had passed no flatus, but she had belched up a great deal of wind. Her bowels had not been moved since the beginning of the attack. Symptoms continued up to the day of admission, but she had been somewhat easier since 9 A.M.

Previous.—Three years ago patient had a 7-months child, and she was in bed ill for a fortnight with abdominal pain.

On admission patient looked ill, with pale and drawn countenance; temperature normal; pulse very soft and weak; tongue thickly furred; chest clear.

Local.—Abdomen distended; oblique ladder pattern of peristalsis marked, and numerous rumblings heard. Per vaginam, uterus felt retroverted and fixed behind to the rectum.

Gastric lavage was performed. A great quantity of very foul faecal matter was drawn off, which gave her immediate relief.

Diagnosis.—Intestinal obstruction in small intestine, due to kinking of the gut, from adhesions in the pelvis, as a result of old pelvic peritonitis. Too ill for a radical and not ill enough for a palliative operation.

Palliative treatment was adopted by lavage, poultices to the abdomen, and nutrient enemata. She passed some flatus, and had a free evacuation; she was not wholly relieved, though much better. On the early morning of operation, 1/2/10, all her symptoms returned acutely. *Mr. Morison.*—Small incision in right iliac fossa; piece of distended small intestine drawn out and fixed. Paul's tube tied in. 3.2.10.—No fæces have passed through the enterostomy, despite the introduction of a large quantity of saline into the bowel. Death.

Necropsy.—On opening abdomen the small intestines were hugely distended. On tracing the dilated gut down the obstruction was arrived at on the right side of the pelvic wall. Here a strong band of adhesion bound a loop of the lower ileum to the lateral pelvic wall, and about 3 ft. of gut, black and nearly gangrenous, was found twisted on itself, lying in the pelvis (secondary volvulus); numerous other small adhesions were present, connecting the small bowel with the fundus uteri; the uterus was retroverted and bound to Douglas's pouch and the rectum by adhesions. On removing the twisted bowel about

5 ins. of the lower ileum and the cæcum were normal, but collapsed, and above this was the twisted portion, about 2 ft. in length, the distended gut being higher still. The enterostomy opening was in a distended portion of the gut, not far from the obstruction. It had not emptied the parietic bowel.

CASE 10.—Strangulation due to a Meckel's Diverticulum—Meckel Gangrenous.—G. T. H., aged 24, a bricklayer, was admitted to the Royal Victoria Infirmary on 20th October. Discharged 7/11/10.

History of Present Illness.—It commenced suddenly 34 hours before admission, 1½ hours after his tea. He was seized with a very severe cramp-like pain across his bowels, bad enough to make him shout out and sweat. Vomiting commenced 2 hours afterwards, and continued during the whole night. The vomiting did not relieve the pain. He had a feeling that if he could only pass wind downwards it would relieve him. The pain and vomiting and sweating continued till his admission.

Enemata were administered soon after his illness commenced, but no relief or discharge of fæces or flatus had resulted. He had no urinary trouble.

Previous Health.—Had been good. He had never suffered from "indigestion" at all.

Condition on Admission.—The patient had the appearance of a strong healthy man acutely ill and suffering greatly. He was lying on his back with both his legs drawn up.

His tongue was moist and furred; pulse, normal; temperature, 96° F.

Abdomen.—On inspection the whole abdomen was distended, and respiratory movements were absent. There was no localised swelling or visible peristalsis. On palpation it was tender all over, and there was marked rigidity of the whole muscular covering. (Four hours previously it had been noted that rigidity and tenderness were limited to the right side.)

On percussion both flanks and a semilunar area over the pubis were dull, and the dullness changed with every change of posture. (Four hours previously the dullness had been limited to the right side, the left being hyper-resonant.)

Per Rectum.—There was fulness in front as of fluid in the rectovesical pouch.

Diagnosis.—All agreed that the patient had acute general peritonitis, with a considerable quantity of free fluid in the abdomen. The cause of this was not so clear, though the physical signs and the sex and age of the patient suggested ruptured duodenal ulcer. The only things against this were the absence of any previous history of indigestion and the constant vomiting since the attack. It seemed difficult to explain the early general peritonitis, the presence of so much fluid,

and the absence of more definite evidence of increased peristalsis if the case was one of acute intestinal obstruction, as had been suggested.

Operation. *Professor Rutherford Morison.*—The abdomen was opened in the middle line by excision of the umbilicus. A large quantity (about a quart) of very foul-smelling grayish-coloured fluid escaped. The stomach and duodenum were normal. The incision was prolonged downwards, great care being taken to keep all the intestines in the abdomen; a mass of distended acutely strangulated bowel with what was clearly a distended gangrenous Meckel's diverticulum was exposed on the right side. The distended sodden bowel for about 3 ft. above the obstruction was withdrawn from the abdomen along with the portion strangulated, and the whole was excised.

The lower or distal end of the bowel was divided about $\frac{3}{4}$ of an inch above the ileo-cæcal valve, and both proximal and distal ends were tightly tied together with silk over a glass bobbin. This was pushed on (intussuscepted) into the cæcum, and fixed there by Lembert's sutures, attaching the ileum to the cæcum. (The anastomosis by the bobbin required 5 minutes.)

The abdomen was washed out with abundance of hot normal saline (5i. of sodium chloride to 1 pint of water), a quantity of dirty fluid escaping from the pelvis, and it was then closed entirely by tier suture.

All of the visible intestine and the parietal peritoneum were bright red, but neither had lost its gloss, and there were no lymph deposits.

As soon as the operation started intravenous transfusion was commenced, and continued slowly during the whole procedure.

Pathology.—A band was found passing from the apex of the Meckel, to be attached to the mesentery close to the base of the diverticulum. The Meckel was twisted on itself, producing gangrene, and a loop of bowel had become strangulated under the band.

After-Progress.—On the day following operation the patient had the appearance of a man entirely relieved of a serious illness, and except for some suppuration of the abdominal wound made a straightforward recovery, and went home on 7th November.

CASE 11. — *Strangulated Gangrenous Hernia—Recovery—Intestinal Obstruction due to Stricture resulting from Gangrene of Gut—Resection—Recovery.*—J. D., age 39, single. Admitted 18 4 10. Discharged 29/4/10. Readmitted 30/5/10. Discharged 29/6/10.

Patient was admitted complaining of a swelling in the right groin, associated with pain and vomiting.

For $7\frac{1}{2}$ years she had had a rupture at that site, which appeared spontaneously and gradually increased in size. For several years she had had slight attacks of pain in it, and had a very severe one 7 weeks before admission. From that time the pain had persisted more or less at intervals. About 2 P.M. on the day before admission she was seized

with a very severe attack of pain, at first localised to the hernia, and later referred to the umbilical region and lower abdomen. Vomiting accompanied the pain, and persisted. The vomitus at first consisted of the stomach contents, but on admission had become bilious. She had her bowels moved during the morning before the onset of the attack, but subsequently passed neither fæces nor flatus.

On admission her general condition was poor, her face was pale and drawn, tongue covered with a yellow fur. Temperature, 97°; pulse, 64.

Local.—There was a swelling the size of a large egg situated below the right Poupart and external to the pubic spine, over the site of the femoral canal. It was tense, hard, extremely tender, smooth on the surface, irreducible, and without impulse on coughing.

Diagnosis.—Strangulated femoral hernia.

Operation—18 4/10. *Mr. Morison.*—Oblique incision below Poupart, sac of hernia separated and opened. On exposing the gut it was almost black, but on freeing the constriction, by dividing Gimbernat's ligament, it recovered its colour somewhat. It was returned to the abdomen just within the femoral ring with a large tube in contact with it. The sac, which was cedematous, was packed with gauze, and no attempt was made at a radical cure, the wound being allowed to granulate. A good pad with firm pressure was applied.

29/4/10.—Wound almost healed; patient went home.

After leaving hospital she was quite well for a week; she then had a sudden attack of acute pain in the abdomen and vomited some mucoid fluid. With the attack her abdomen swelled up and there were loud rumblings. Her bowels were constipated and the passage of flatus gave her temporary ease. Subsequently she had a similar attack almost every evening.

On readmission she looked in fair general condition; tongue was moist and furred; temperature, 98·6°; pulse, 88.

Local.—There was a small sinus present in the middle of the scar in the right groin. On examining the abdomen definite peristalsis of the oblique ladder pattern was visible, which, on palpation, appeared to culminate in the region of the right iliac fossa. There were numerous rumblings in addition, also in the right iliac fossa. Associated with this she had repeated vomiting.

Diagnosis.—Intestinal obstruction due to adhesions in connection with the old hernia.

Operation—7 6/10. *Mr. Morison.*—An incision was made, extending from the anterior superior iliac spine to 1 inch from the symphysis pubis in the right iliac fossa. On opening the abdomen the ileum, about 3 ft. from the ileo-cæcal valve, was found adherent to the femoral canal; above, the intestine was distended, injected, and hypertrophied; below, it was thin and pale. On separating the

adherent gut it was found that only the mesenteric side of the intestine was left, the convexity and sides of the gut had disappeared (gangrene and absorption). The bowel above and below this region was clamped and divided by the thermo-cautery. End-to-end anastomosis was performed by a Murphy's button, after resection of the damaged intestine. Abdominal wound closed in layers.

21/6/10.—Patient made a slow but good recovery, and left hospital healed and well.

CASE 12.—*Large Ventral Hernia—Strangulation—Resection of 9 ft. of Intestine.*—Female, aged 50, admitted to the Royal Victoria Infirmary 14/10/10.

History.—Three and a half years previously she had been operated on for an appendix abscess, which was opened and drained. After the wound healed she developed a hernia through it, which had gradually increased in size, but caused no inconvenience till two days ago, when pain in her abdomen commenced at 8 P.M. Six hours later she vomited. Since then the pain and vomiting had continued, she had much rumbling of wind, and had passed no flatus or fæces.

On admission the patient was an enormously stout woman; she looked fairly well; tongue moist and furred; pulse, 84; temperature, 100° F.

The abdomen was swollen. A large ventral hernia on the right side under a scar was tense, tender, and irreducible. Part of it was softer than the rest.

Diagnosis.—Strangulated ventral hernia causing acute intestinal obstruction.

An operation was performed by Mr. Richardson, who found the tumour about equal to two footballs in size, the sac multilocular and containing some tightly strangulated intestine. The strangulation was relieved, but it was obviously impossible to replace the contents of the sac in the abdomen, and the skin was sutured over them. The wound suppurated, a faecal fistula developed, and an attempt was made unsuccessfully to close this on 9/11/10.

Operation—20/11/10. *Mr. Morison.*—A large elliptical incision was made enclosing the fistula, the edges were closed by sutures, and the sac opened. The underlying intestinal coils were firmly adherent to the skin and to each other, and great difficulty was experienced in separating them and defining the opening of the sac. Eventually 9 ft. of small intestine were resected, the lower point of division being just above the ileo-cæcal valve. An end-to-end anastomosis was made with a glass bobbin and by invagination, the sac was excised, its neck sewn up, and the abdominal wall was closed in separate layers, with a tube under the skin for drainage.

The patient made a good recovery, but on 9/12/10 (3 weeks after operation) it is noted that "her bowels are moved 5 times daily."

20/12/10.—“Patient made a good recovery. The diarrhoea is much better.” Recovered.

Subsequent Note.—This patient died at home 2 months later as the result of persistent diarrhoea.

CASE 13. — *Multiple Malignant Strictures of Small and Large Intestine.*—Male, aged 39, admitted to private hospital, 18/5/10.

History.—Five weeks previously he had an attack of acute intestinal obstruction, but it only laid him up for 6 days. Since then he had suffered from pain, flatulence, and occasional vomiting till 24 hours before admission, when he had another acute attack. Fourteen years ago he had phthisis pulmonalis.

On admission he was in very poor condition; pulse, 95; temperature, 99.2° F. All the signs and symptoms of acute intestinal obstruction were present, with free fluid in the abdomen.

Diagnosis. — Acute intestinal obstruction due to tuberculous peritonitis.

Operation.—The abdomen was opened by an oblique incision in the right iliac fossa and a quantity of blood-stained fluid escaped. A malignant stricture was found in the end of the ileum, with the gut on its proximal side much distended and the cæcum empty and collapsed. The entire visible and palpable peritoneum was studded with malignant growths and also the omentum, a portion of which was removed for microscopical examination. A lateral anastomosis was made between the ileum above the stricture and the ascending colon and the abdomen was closed.

Progress. — For the first two days after operation the urgent symptoms were relieved, but he was never well. Later the symptoms of obstruction returned, and he died 5 days after the operation (23/5/10).

Post-mortem examination showed malignant deposits studded everywhere in the abdomen. There were several on the small intestine, causing a certain amount of stricture. There was a tight stricture of the hepatic flexure of the colon, which was obviously the cause of recurrence of the obstruction. There was septic peritonitis.

Microscopic Report.—“Columnar-celled cancer, with a tendency to colloidal degeneration.”

CASE 14.—*Spheroidal-celled Carcinoma of the Ascending Colon with Ovarian Cyst.*—M. J. G., aged 62, married. Admitted 6/4/10. Died 16/4/10.

Patient gave a history of many years' duration of attacks of indigestion, accompanied by excessive wind and vomiting. Three weeks ago she began to have pains in the abdomen. Four days ago, after cycling in the evening, she was seized with severe griping abdominal

pain; castor oil gave a good evacuation of the bowels and relieved her somewhat, but she did not sleep well at night. The following day she was fairly well, but sent for the doctor in the evening on account of a feeling of heaviness in the stomach. She vomited repeatedly the next 2 days, the vomiting being bilious and not faecal. On the evening before admission she felt much better and remained so till the day after, *i.e.* 7/4/10, when she vomited again. Rumbblings were present with the attack, and flatus was passed.

On admission patient was of a sallow complexion, and looked very weak, thin, and emaciated; temperature, normal; pulse, 90.

Abdomen.—On inspection distension present, suggesting small intestine. On the right side opposite the umbilicus there was felt a hard nodule, not very tender and not movable. A suggested diagnosis was “impacted gall-stone” in the small intestine, for the following reasons:—

1. The long history of “indigestion,” with wind and vomiting.
2. Since present onset her tendency to have periods of improvement.
3. The feeling of the tumour.
4. The limitation of distension, &c., to small intestine.

Peristalsis was visible, of the oblique ladder pattern. The patient was too ill for a radical operation and not ill enough for enterostomy.

10/4/10.—Patient improved, bowels moved. A tumour was now felt at the same site as previously, very hard and nodular, and quite fixed. Previous diagnosis negatived. Per vaginam an ovarian cyst was felt, the size of a foetal head, uncomplicated.

Present Diagnosis.—Carcinoma of the ascending colon, malignant mass secondary in the ovarian tumour.

12/4/10.—Symptoms of obstruction have increased; patient very ill.

Operation—13/4/10. *Mr. Morison.*—Long oblique incision, as for appendix abscess, extending well back into the loin. Abdomen opened. The tumour appeared to be a malignant growth of the ileo-cæcal valve, with many large and secondary glands in the mesentery extending up to the duodenum. The outer reflection of peritoneum from the cæcum and ascending colon on to the posterior belly wall was now divided and this part of the large intestine easily separated and brought forward. The ileum was divided about 6 ins. from its termination and then the distal part of the ileum, the cæcum, ascending colon, and $\frac{1}{4}$ of the transverse colon were removed. The procedure was most difficult owing to the huge glands in the mesentery, extending to and lying on the third part of the duodenum. The ileo-colic artery was divided close to its origin from the superior mesenteric, the vein being clipped at about the same spot. There was some hæmorrhage from slipping of the ligature. The glands were the size of

walnuts, hard and surely malignant. The cut end of the transverse colon was closed in the usual way, but the end of the ileum was brought out of the wound posteriorly and a Paul's tube tied in. The abdominal wound was sutured in layers.

Pathology.—The growth proved to be arising in the ascending colon, having spread into the cæcum, but not having involved the ileo-cæcal valve. The glands, extending right up to the duodenum, appeared to be infiltrated with growth.

Microscopic Report.—"The lymph gland has been almost entirely replaced by a diffuse carcinomatous deposit; appearances suggest a rapidly advancing growth of spheroidal type, almost encephaloid in character. The tumour is a rapidly growing columnar-celled cancer, showing a tendency to diffuse infiltration, with cells of a more spheroidal type."

Subsequently patient suffered from shock, and as Paul's tube did not drain well, Mr. Morison performed enterostomy higher in the intestine under anæsthesia, but no fluid or flatus was passed. She died 15/4/10, in spite of frequent stomach lavage, oxygen, and saline.

Post Mortem.—No sepsis; no dilatation of the stomach; operation sites healthy; small intestine still distended. A single enlarged hard gland the size of a filbert was found on the aorta. A large ovarian cyst the size of a cocoa-nut was found in the pelvis; it was not malignant.

CASE 15.—*Adenomatous Polypus of Small Intestine with Chronic Intussusception.*—A male, aged 64, admitted to the Royal Victoria Infirmary 3/11/10.

History.—Three weeks ago the patient, previously quite well, was suddenly seized with a sharp pain in his stomach half an hour after his dinner. An hour later he vomited matter of a dark-brown colour. This did not relieve the pain. A bowel motion which he had the same evening was very dark in colour. The pain had lasted off and on till his admission. It was worst after meals and woke him up at nights. Vomiting had not been frequent. His bowels had acted regularly and were not constipated. On the morning of admission he had retention of urine, which was relieved by a catheter.

On admission he looked a robust man somewhat reduced by pain; temperature and pulse were normal.

Abdomen.—There were definite rumbling sounds heard in the abdomen and active peristaltic movements of the small intestine type were visible. A tumour could be felt to form and harden intermittently close to the right of the umbilicus. Both flanks were dull on percussion.

Diagnosis lay between a malignant growth of the intestine and chronic intussusception, possibly both.

Operation—4/11/10.—The abdomen was opened in the middle line after excision of the umbilicus. Clear fluid escaped; the small intestine was large, thick and congested. An intussusception 5 ins. long was found in the small intestine close to the ileo-caecal junction. On reducing it a tumour about the size of a walnut was felt in the lumen of the bowel. Enterotomy was performed and the polypus was excised after ligaturing its pedicle. The intestinal wound was closed by an inner layer of through-and-through catgut sutures and an outer layer of silk Lembert sutures and the abdomen by 3 tiers of sutures. Recovered.

Report of Pathologist on Polypus.—"This appears to be a simple adenomatous polypus. The fibrous core shows a considerable quantity of unstriped muscle; it is very vascular, and shows oedematous change. There is some inflammatory change superadded"

CASE 16.—*Malignant Papilloma of Sigmoid—Resection*.—A male, aged 58, admitted to Royal Victoria Infirmary 11/11/10.

History.—The patient was operated on for hemorrhoids 5 years ago, and for the last 4½ years had been treated for "mucous colitis." With his stools, which were usually looser but sometimes consisted of round hard masses, he had passed slime and blood. He often had a twitching pain before defaecation and, after it, a feeling that his bowel had not been properly emptied, but never a severe pain, only a bearing down. When flatus was passed mucus often escaped involuntarily at the same time.

On admission he looked well and had a normal pulse and temperature.

Abdominal and rectal examination were negative in result.

With the sigmoidoscope (Mr. Hamilton Drummond) a small polypus on the right rectal wall and, 7 ins. from the anus, and out of digital reach, a large, soft, flattened papillomatous growth, which bled readily, were seen.

Operation—17/11/10.—The abdomen was opened by an oblique incision in the left iliac fossa and the growth was felt in the lower part of the pelvic colon. The lower half of the sigmoid with its mesentery was excised and an end-to-end anastomosis by the invagination method was performed between the remainder of the sigmoid above and the rectum below. The abdominal wound was closed in 3 layers. Recovered.

Pathological Report.—"This appears to be a papillary adenoma. Owing to the complicated papillomatous arrangement it is difficult to determine the absence of infiltration into the muscularis mucosae, but so far as can be seen at present the condition does not appear to be malignant."

Note.—I made a macroscopic section and found the bowel wall infiltrated with growth and have no doubt of its malignancy.—R. M.

CASE 17.—Ileo-caecal Tuberculosis mistaken for Appendic Abscess—Chronic Intestinal Obstruction—Resection—Enterostomy—Acute Intestinal Obstruction and a Second Enterostomy—Excision of Involved Intestine and Anastomosis.—Male, aged 30, admitted to the Royal Victoria Infirmary 24/4/10.

History.—For the past 3 weeks the patient had had trouble in his bowels—gripping pains and much rumbling. Four days before admission he was suddenly seized with very severe pain at 3 P.M. The pain was intermittent and was associated with frequent vomiting and much rumbling. He was able to pass flatus. His bowels had moved daily. During his illness he had heavy night sweats and had lost about 1 stone in weight.

On admission he looked feeble and ill, but his acute symptoms had subsided. His tongue was furred; pulse, 90; temperature, 99° F.

Abdomen.—There was no rigidity. A large hard mass, slightly tender, was found in the right iliac fossa with a smooth surface, except for a small hard nodule which projected from its upper and inner aspect; its edge was fairly well defined and the whole swelling was slightly movable. During palpation gurglings could be heard and felt in its neighbourhood. Percussion over the lump showed diminished, not absent, resonance.

Diagnosis.—Appendix abscess of long duration with dense adhesions.

Operation—26/4/10.—The abdomen was opened by a long oblique incision in the right iliac fossa. The mass proved to be no abscess. The bowel and peritoneum in the right iliac fossa were enormously thickened and infiltrated and so adherent that the appendix could not be isolated. It was impossible to say whether the condition was the result of growth or inflammation, and it was decided to remove the whole of it. The Jamieson-Dobson operation of removal of the whole ileo-colic distribution was performed and the cut end of the colon was closed by sutures. On account of his poor condition a Paul's tube was tied in the divided end of the ileum and the wound was closed in layers round this. For some days his progress was satisfactory, then he began to develop abdominal pain and to vomit, with increased peristalsis and rumbling; the discharge from the ileum ceased and it was clear he had acute intestinal obstruction.

Second Operation—7/5/10, by *Mr. Richardson.*—The abdomen was opened by a median incision and the obstruction was found to be due to constriction of the gut by the healing of the wound. The constriction and gut were divided and the obstruction was relieved. Subsequently the patient improved slowly, but refused further surgical help, and decided to go home to the country with his enterostomy wound discharging and the surrounding skin in an excoriated condition.

Pathology.—The specimen consisted of the last 6 ins. of the ileum.

the cæcum, the ascending colon, and ileo-colic mesentery. On section the lumen of the cæcum up to the ileo-cæcal valve was almost obliterated by a dense white fibrous cicatricial mass. The mucous membrane appeared to be normal but was thrown into polypoid folds by the fibrosing submucous tissue. The end of the ileum was prolapsed for about 1 in. into the cæcum, so as to look like the uterine cervix. (This appearance is common in tubercle and cancer of this region. —R. M.) Enlarged glands were present throughout the mesentery.

Microscopic Report, Professor MacDonald.—“*Gland.*—No evidence of malignant disease or tubercle. Appears to be of simple inflammatory origin. *Growth?*—Hyperplastic thickening of all the coats of the intestine, with marked lymphocytic infiltration of all the coats. The condition is probably tuberculous, though there is no distinct evidence of it. There is no evidence of tumour or growth.”

Readmitted 16/9/10.

The patient's condition was much improved, and he had gained considerable weight since going out. The median wound was entirely healed; from the iliac one the mucous membrane of the bowel was protruding. All feces had been passed through this since his first operation.

Third Operation—22/9/10.—The old median scar (Mr. Richardson's) was excised and it was surprising to see so few (none but necessary) adhesions in the peritoneal cavity. A lateral anastomosis was made between the lower ileum and the right transverse colon with a through-and-through inner layer of catgut sutures and an outer of silk, then the ileum was divided transversely and its distal end sewn up distal to the anastomosis. The mesentery of the isolated bit of ileum was next tied off and cut, a pair of forceps was passed up through the enterostomy opening, and the bowel, turned inside out, was drawn through the enterostomy opening. The edges of the median incision were next closed, and then the inverted bowel and the edges of the oblique iliac wound were excised. When this had been done it was found that the edges of the iliac wound could not be drawn together, and that a gap of at least 1 in. remained with the tightest suture that could be applied. This was considered to be due to contraction of the divided muscles, and it was thought that the traction of temporary tight thick sutures would in a few days overcome the retraction and allow of approximation. The right iliac fossa was consequently packed with gauze and six thick sutures with a good bite were passed through the edges and whole thickness of the wound and tied firmly in a bow knot over the gauze. Four days later (26/9/10) the gauze was taken out and the silk sutures were tightened up, bringing the wound edges readily into apposition. He was discharged in excellent condition with the wound healed except for small superficial granulations 3 weeks later (10/10/10). Recovered.

CASE 18.—*Hyperplastic Tuberculosis of the Cæcum—Excision.*—Female, aged 20; single, was admitted to private hospital 8/10/10.

History.—She was quite well till 2 years ago. Eighteen months ago she was operated on for appendicitis. Five weeks after the operation a sinus formed in the wound and had continuously discharged faecal matter since. She had had much cramping pain in the right iliac fossa with wind rumblings, and had to sleep with a hot bottle on the side.

On admission the patient was bright, intelligent, and fairly healthy looking. No disease was found except that noted.

Abdomen.—There was a keloid scar in the right iliac fossa with two fistulae posteriorly, from which sero-pus was discharging. There was a tender resistant mass to the right of the umbilicus.

Diagnosis.—Ileo-cæcal tuberculosis.

Operation—12/10/10.—The old scar was excised and the abdomen was opened by a long oblique incision in the right iliac fossa after dividing the skin in an ellipse round the fistulae, turning it over a dossil of gauze, and suturing it. A tangled adherent mass was found in the right iliac fossa involving the ileum, the cæcum, and the transverse colon which had been dragged down to it. The vermiform appendix was lying below, separate, free, and apparently healthy. After mobilisation of the mass by division of its outer and upper peritoneal reflections, the lower 6 ins. of the ileum, the cæcum and vermiform appendix, the ascending and the right half of the involved transverse colon and their mesentery were excised, and the ends of the colon and ileum were closed, a lateral anastomosis being made between the ileum and the left half of the transverse colon by a Murphy button. During the operation the patient, although apparently unhurt, had intravenous transfusion of 2 pints of normal saline. Recovered.

Pathology.—The mesentery contained many enlarged caseating glands, some of which were calcareous. The bowel wall was much thickened—a typical example of hyperplastic tuberculosis—and the ileo-cæcal opening constricted.

Microscopic Report.—"The section is typical of hyperplastic tuberculosis."

CASE 19.—*Hyperplastic Tuberculosis of the Cæcum.*—T. R., aged 48, married. Admitted 18/3/10. Discharged 13/4/10.

Patient gave a long history of abdominal trouble. Ten years ago he had an attack of what he called "catarrh," accompanied by diarrhoea and sickness, and associated with swelling of the abdomen. With this attack he was laid up in bed for 3 weeks, and he had frequent subsequent similar attacks, lasting a few days. Two years ago he was awakened during the night by a sudden severe pain, spread diffusely over the abdomen, which lasted 5 hours. The pain was accompanied

by rumblings and diarrhoea, and he vomited repeatedly, this latter lasting 24 hours. His motions during the attack were black, and the doctor stated this was not due to medicine. Heat relieved the pain somewhat. He was in bed for 3 weeks and had no return of the pain, but his right side was very tender, and he was kept on light diet for some time. He remained well after this till a month ago, when he had a slight similar attack and another a fortnight ago, which only kept him in bed for 1 day. On the day before admission he was again seized at night by a very severe pain across the abdomen, lasting a few hours and gradually subsiding, so that by the day after admission he was unable to feel it. He was sick and vomited several times the day following the onset, but the vomitus was not faecal. The pain was never localised. As a general rule his bowels had to be regulated by aperients; he had had no urinary symptoms.

On admission patient looked in fair condition, though thin; temperature, 99·2° F.; pulse, 66; chest, clear.

Abdomen.—Thin belly wall; no suggestion of abnormality on inspection. On palpation a definite tumour the size of a hen's egg could be felt in the right iliac fossa; it was hard in consistency, its surface was rounded, the upper edge was well defined though it was more indistinct below, and it was fairly well fixed down to the iliac fossa, while the anterior belly wall was freely movable over it. Gurgling was demonstrated above the tumour but not over it, and the mass was quite separate from the kidney.

Per Rectum.—Nothing abnormal was felt in the lumen, but high up on the right side an enlarged gland the size of a hazel-nut was felt.

Diagnosis.—Tuberculosis caecum—chronic appendix.

Operation—23 3 10. *Mr. Morison.*—Long oblique incision in the right iliac fossa prolonged well back into the loin. The tumour was exposed and found to be a chronic inflammatory mass at the caput caeci, with a firm matting of adhesion to the middle of the transverse colon. The appendix was found buried in the mass and was thought to be the origin of the trouble, being firmly adherent to the caecum and communicating with it by a large hole which would admit the little finger. The appendix was removed, was found to be about 2 ins. long, and was little more than a fibrous band. After its removal there was still a large hard fibrotic thickening in the caecal wall, and, owing to the doubt entertained as to its nature, it was considered the proper treatment to remove it. The ileum was divided about 5 ins. from its termination between clamps by the cautery, and the cut end was closed in the usual way by through-and-through catgut and silk lemberts. The ascending colon was divided immediately above the caecum and dealt with in a similar manner. A lateral anastomosis between the ileum and ascending colon was now performed by direct suture—through-and-through catgut sutures covered in by silk lemberts.

A small opening was purposely made to imitate the ileo-cæcal valve. Abdominal wound closed in layers.

Specimen.—This showed thickening of the cæcal wall, but on inverting the latter there was no definite evidence of growth (tubercle or cancer) in the lumen of the gut. In the mesentery of the cecum was a hard calcareous gland, the only real evidence of tuberculosis. There was slight stricture of the ileo-cæcal orifice, but the valve showed no change.

Microscopic Report.—Hyperplastic tuberculosis. Peritoneal coat is thickened and very vascular; muscular and submucous coats are markedly thickened and show diffuse fibrosis, also numerous lymphocytic foci with caseous centres and a few typical giant cells.

12 4 10. —Healed by first intention; good recovery. (Going home.

CASE 20.—*Ileo-cæcal Tuberculosis?—Acute Intestinal Obstruction—First Operation—Lateral Anastomosis. Second Operation—Excision of Bowel.*—A miner, aged 18, admitted to Royal Victoria Infirmary 27/6 10.

History.—Two years previously he had an attack of pain in the right iliac fossa associated with vomiting, diarrhoea, and the passage of bright red blood. At this time he was in a hospital for 3 months, and during his stay there he had night sweats, and for 6 weeks his temperature varied from 101° F. to 106° F. Subsequently he worked as a miner, but had frequently recurring attacks of diarrhoea unaccompanied by bleeding. During the last two months he had lost weight from continual diarrhoea, his bowels being moved 8 or 10 times daily. For the last month he had been unable to work from abdominal distension, pain, and rumblings.

His mother died of consumption.

On admission he was not looking ill, and nothing wrong was found except as noted.

Abdomen.—This was considerably distended, and peristalsis of the oblique ladder pattern, characteristic of obstruction low in the small intestine, was present. No mass was palpable, and there was no evidence of free fluid.

Diagnosis.—Intestinal obstruction due to ileo-cæcal tuberculosis.

Operation—28 6 10.—The abdomen was opened in the median line below the umbilicus. The whole of the ileo-colic group of glands were enlarged and hard, and there was a mass of adhesions round the cæcum. A lateral anastomosis was performed between the lower end of the ileum and the transverse colon, and the abdominal wound was closed in layers.

For 12 days after the operation he was free from his old pain and then had a mild attack of intestinal obstruction. This was followed by others of a similar nature, though his general condition had much improved.

Second Operation—9 8/10. —A large firm mass was now felt under the anæsthetic in the right iliac fossa. The old scar was keloid. The abdomen was opened by excision of the umbilicus and the scar. Seven inches of the ileum distal to the anastomosis, the cæcum, vermiform appendix, ascending colon, and the transverse proximal to the anastomosis with their mesenteries were excised, the divided ends of the ileum and the transverse colon sutured, and the abdomen closed by 3 tier sutures. Recovered.

Pathology.—A band of omentum was adherent to the ascending colon. (It seemed likely that this was the cause of the obstruction.) The whole of the excised gut was hypertrophied and oedematous and some tuberculosis was present on the outer surface of the cæcum. There was thickening of the ileo-cæcal valve but no obstruction.

Microscopic Report.—"The wall of the intestine is swollen and oedematous but there is no evidence of inflammatory thickening. The mucosa is especially swollen and thrown into thick folds, and there is an excessive formation of mucus in the lining cells. The thickening is largely the result of oedema. There is no evidence of tubercle or new growth."

CASE 21.—Carcinoma of Caput Cæci intussuscepted into the Ascending Colon.—S. A., aged 64, widow. Admitted 7/4/10. Discharged 2/5/10.

Patient admitted with a lump in her right side. She first noticed the lump 7 days ago. She had great discomfort and a feeling of fulness, but no pain. On the day before admission pain commenced across the abdomen, going down to the lump, gradually increasing in severity as the day went on. Medicine only relieved her temporarily, the pain recurring at intervals afterwards. Since the commencement of her illness she had noticed rumblings, not loud but frequent. During the last 3 months she had been losing flesh and her appetite had been very poor. Her mother died of cancer of the breast.

On Admission.—General condition: thin, pale, small, feeble woman; temperature, 98° F.; pulse, 80.

Local.—In the right side there was a soft cystic-like mass under the bowel: it moved freely on manipulation, but not much with respiration. The whole mass was indefinite, and the characters difficult of ascertainment. It was somewhat tender. Per vaginam a definite tumour rounded and tender was felt in the right iliac fossa and so was in close contact with the uterus.

Diagnosis.—Carcinoma of ascending colon or ovarian cyst (pedicle? twisted).

Operation—12 4/10. *Mr. Morison*.—Median infra-umbilical incision: abdomen opened. The ileum was found intussuscepted into the ascending colon, the apex being formed by the cæcum with a growth. The

pelvis was found clear, thus putting out of count the possibility of ovarian tumour. The lower part of the ileum, the caecum, and ascending colon were now excised, being divided between clamps by thermocautery. That part of the mesentery in the ileo-colic distribution was also removed to clear out the glands and lymphatics. The cut ends of the gut were closed in the usual way by continuous through-and-through catgut and overlying silk lemberts. Lateral anastomosis was now proceeded with by simple suture between the lower end of the ileum and the transverse colon. The silk lemberts were interrupted. The anastomotic opening was about $1\frac{1}{2}$ ins. long. Abdominal wound was closed in layers in the usual way.

Pathology.—The growth appeared to be in the caput cæci and not ileo-caecal valve, which ultimately proved to be so, it arising about the base of the appendix, which could not be found. The growth was sessile and the size of a walnut.

Microscopic Report.—"The tumour itself is a columnar-celled carcinoma, widely infiltrating beyond the muscularis mucosæ. Gland from mesentery shows chronic inflammatory change, marked endothelial proliferation, but no evidence of malignant deposit."

2/5/10.—Patient made an excellent recovery and left hospital healed.

CASE 22. — *Carcinoma of Ascending Colon — Death from Acute Dilatation of the Stomach.* — J. F., aged 43, married. Admitted 14/3/10. Died 17/3/10.

Admitted complaining of a lump in the right side. History of 15 months' abdominal trouble. He had good health previously, but since this time he had had attacks of severe pain across his lower abdomen almost every day, coming on suddenly and going off quite as suddenly. They came on at any time, having no relation to food or rest. He had never been sick or vomited, there had been no intestinal rumblings, and the pain was not relieved by defæcation or micturition, nor did change of position affect it. He had never been jaundiced, and had had no diarrhœa. He had lost 1 stone in weight during the last 2 months, his appetite had gradually become worse, and recently he had not slept well. Patient's father died of "cancer of the bowel."

On admission patient looked in fairly good condition; temperature, 98.8° F.; pulse, 100.

Local.—A hard nodular mass was felt to the right and a little below the level of the umbilicus. It was well defined and freely movable by manipulation, and could be moved into the flank. It moved slightly with respiration, but it could be prevented from so doing by grasping it bimanually. It was not tender, though he held himself somewhat rigid, thus rendering palpation slightly more difficult than usual. Nothing else abnormal could be detected in the abdomen.

Per Rectum.—Nothing abnormal felt. Patient had an occupation kyphosis and slight scoliosis—no rigidity of spine.

Diagnosis.—Appendix abscess.

Operation—16 3 10. *Mr. Morison*.—Resection of ileum, cæcum, and ascending colon (Jamieson-Dobson) for a growth in the ascending colon; lateral anastomosis between stump of ileum and transverse colon by direct suture. No secondary deposits on peritoneum or liver. Patient stood the operation well.

After-Progress.—Patient appeared well for the first 40 hours, when he collapsed and presented signs of acute dilatation of the stomach. On washing it out it contained about $\frac{1}{2}$ a pailful of dirty blackish fluid. It was washed out 2 or 3 times subsequently, on each occasion a large quantity of fluid being removed. He did not pick up, and died 3 days from the operation.

Post Mortem.—Belly opened; no sign of any sepsis. All in connection with the operation perfect. The stomach was so large and lax as to occupy the greater part of the abdomen, the pyloric end and the first part of the duodenum containing many submucous hæmorrhages; the duodenum and 2 ft. of the adjoining jejunum were also very much dilated.

Microscopic Report of Gland Removed.—Chronic inflammatory changes; no evidence of malignant deposit.

Growth.—Carcinoma of columnar-celled type.

CASE 23.—*Carcinoma of Ascending Colon—Injury 3 Years Previous—No Bowel Symptoms*.—W. H., aged 59. Admitted 4 3/10. Death 29/3/10.

Admitted complaining of pain in the back and across the bowels. Ascribes his trouble, three years ago, to a fall of stone down the pit. His back was injured and he had loss of power and sensation in his legs, and marked hæmaturia for 3 or 4 days. He had never been fit since, and had been in receipt of compensation practically continuously up to the present. For the past 2½ years he had complained of short sharp pains in the right loin, with pain and swelling in the abdomen, the loin pain radiating into the inguinal region, but not into the scrotum or thigh. It had become worse, and lately he had complained of soreness in the back when touched there. Some days patient passed a great deal of clear urine, while on others only a little, with brick-red deposit.

Frequency.—None during the day; had to get up 2 or 3 times during the night.

Pain.—Had some at the end of micturition.

Stream.—Some difficulty in starting, and the stream often stopped and recommenced; size and force usually good.

Urine.—Had noticed no blood, gravel, or "matter" in urine.

Patient had lost at least 1 stone in weight recently. He had had no vomiting and was constipated; troubled with flatulent rumblings.

On admission patient very anæmic; temperature, 98·2 F.; pulse, 100.

Abdomen Inspection.—A slight bulging was seen in the right loin, somewhat below the level of the umbilicus.

Palpation.—A large hard tense tumour was felt in the right ilio-costal space, rather lower than usual for kidney. It was somewhat movable bimanually, and moved with respiration. It was slightly tender.

Percussion.—Loin was dull; tumour had resonance in front of it. No other abnormality found.

Urine.—Sp. gr. 1010.

Acid.—No albumen or sugar.

X-Ray of Right Kidney.—No abnormal shadow shown.

Cystoscopy—Bladder normal. An attempt at catheterisation of the ureters failed from hæmorrhage into the bladder.

Diagnosis.—Carcinoma of kidney (though rather low in situation).

Operation—15/3/10. *Mr. Morison.*—Incision through right rectus muscle to enable the opposite kidney to be examined. On opening the abdomen the mass was found to be a large malignant growth of the upper part of the ascending colon lying on the kidney. The ascending colon with the growth was mobilised by dividing the lateral reflection of the peritoneum on the outer side of the bowel and then the lower part of the ileum for about 6 ins., and the whole ascending and half the transverse colon with the whole of the mesentery in the distribution of the ileo-colic artery were resected with their glands and lymphatics (Jamieson and Dobson operation), the gut being divided with the thermo-cautery, and the ends closed by through-and-through catgut and super-imposed silk lemberts. A lateral anastomosis was performed by simple continuous suture between the ileum and transverse colon. Belly closed in layers after insertion of drainage tube through the loin. Patient transfused during the operation.

Microscopic Report of Growth.—“Columnar-celled carcinoma.”

Four days after operation patient developed a faecal fistula, and went steadily back. He died on the 29/3/10—14 days after operation.

Post Mortem.—Showed enormous dilatation of the stomach. Much pus and faecal matter were found at the site of operation. The anastomosis could not be demonstrated, and the gut was open at that site, the sutures having evidently given way. The distal ends of both parts of the bowel were closed and showed no evidence of yielding—there was so much matting and dirt that it was difficult to obtain a clear view. The liver had 2 small nodules in it, which were sent for microscopic report. Kidneys and other organs healthy.

Microscopic Report of Nodule from Liver.—“Columnar-celled carcinoma; undergoing extensive colloidal degeneration.”

CASE 24.—*Malignant Gall-Bladder Adherent to and Perforating the Hepatic Flexure of the Colon, and Causing Chronic Intestinal Obstruction.*—Female, aged 61, married, admitted to private hospital 11/7/10.

History.—Four months previous to admission she began to be troubled by abdominal pain and rumblings, and began to lose flesh rapidly. The pains were similar to those produced by taking strong purgative medicine, and had kept her much awake at night. The rumblings were so loud as to be heard by anyone near. She had great difficulty in getting the bowels to move. Had never been sick or had diarrhœa, and had no appetite. For 20 years she had suffered from “flatulence and spasms” in the stomach, coming on in attacks.

On admission she looked fairly well, but was thin. Tongue clean and moist; teeth, false; pulse, 108; temperature, normal.

Abdomen.—In the right iliac fossa a large hard nodular mass was found. Its lower and lateral margins were well defined, but its upper limit could not be satisfactorily felt. It moved slightly downwards on deep inspiration, was not firmly fixed, and did not extend into the loin behind. There was no evidence of free fluid in the peritoneum, and no palpable enlargement of the liver or of the supraclavicular glands.

Diagnosis.—Carcinoma of the ascending colon, causing chronic intestinal obstruction.

Operation—14/7/10.—Under the anæsthetic the tumour could be seen moving very freely with respiration. An oblique incision opened the abdomen over it and exposed the omentum lying over and firmly fixed to the tumour, suggesting an error in diagnosis. On separating the omentum the peritoneal cavity was packed off and a knife was thrust into the outer aspect of the tumour, which was now clearly seen to be an enlarged gall-bladder. About 4 ozs. of pus and a number of gall-stones escaped. The gall-bladder, which was very adherent, a tongue-shaped projection of liver, and a portion of the right lobe to which it was attached were excised with great difficulty, a perforation between the gall-bladder and the hepatic flexure of the colon being exposed and sutured. The abdominal wound was closed in layers without drainage. Recovered.

Pathology.—The gall-bladder had very thick walls calcareous in parts. It presented multiple holes where it had perforated into the colon and the liver. The calculi varied in size from a blackbird's egg to a millet seed, the largest being impacted in the neck of the gall-bladder. All were white on the surface from a coating of cholesterolin.

Microscopically a section showed typical columnar-celled cancer.

CASE 25.—*Carcinoma of Transverse Colon—Excision and Lateral Anastomosis.*—A. H., aged 44. Admitted 8/4/10. Discharged 29/4/10.

Patient gave a 7 weeks' history of bowel trouble, though she stated that 2½ years ago she had a large discharge of “corruption” from the

bowels—blood and other material. This did not recur, and she had been free from symptoms till 7 weeks ago. Since then she had had abdominal pain, of an intermittent character, lasting only for a short period at each attack and associated with rumblings of wind, which were quite loud. She had passed no flatus recently, but for how long she was unable to say. She had noticed that the bowels swelled up and lumps appeared, which came and went with the rumblings. Her bowels had for the most part been constipated, but she had one attack of diarrhoea lasting 2 days, followed by constipation. She had passed no blood. She had lost a great deal of flesh lately, and had been unable to rest for pain.

On admission the patient was much emaciated; tongue dry and furred; temperature and pulse normal; chest clear.

Local.—Abdomen flaccid, but some distension present. A large mass was seen to rise in the upper part of the abdomen, with peristalsis from right to left, ceasing at the left costal border, like the transverse colon. This occurred intermittently. On palpation no tenderness or rigidity were present, but a mass was felt in the left hypochondrium, hard, nodular, fairly well defined, and freely movable. It did not move with respiration. The portion of gut which was above described as exhibiting excessive peristalsis, and which was felt to harden, terminated at this mass. The liver was felt below the costal margin, but no nodules were demonstrable on its surface. No free fluid in the abdomen.

Per Rectum.—Some ballooning was present, but no evidence of growth. No glands were felt in the left posterior triangle of the neck, or any secondary deposits in the pelvis.

Diagnosis.—Carcinoma of the colon in the neighbourhood of the splenic flexure, with obstruction of the bowel from stricture at this site.

Operation—14/4/10. *Mr. Morison.*—Median supra-umbilical incision: abdomen opened. A large freely movable malignant growth was found in the transverse colon, with secondary glands in the meso-colon adjacent. The growth was resected with several inches of bowel on either side and the associated meso-colon. The bowel was clamped and divided by the thermo-cautery, and the ends closed by through-and-through sutures of catgut with overlying silk lemberts. A lateral colico-colic anastomosis was now performed by simple suture, the silk lemberts being interrupted. Belly closed in layers.

Subsequent.—Patient very ill for the first few days, but made an uninterrupted recovery, and left hospital with wound healed, and very well, 29/4/10.

Microscopic Report of Growth.—"Columnar-celled carcinoma."

CASE 26.—*Inoperable Carcinoma of Splenic Flexure of Colon.*—A female, aged 65, admitted to the Royal Victoria Infirmary 20/6/10, with repeated attacks of intestinal obstruction of 3 months' duration.

Operation showed an adherent growth of the splenic flexure with extensive glandular involvement. Permanent colostomy in transverse colon. Recovery.

CASE 27.—*Intestinal Obstruction from Malignant Growth in Sigmoid Colon—Three Operations.* 1. *Cecostomy for Relief of Obstruction.* 2. *Excision of Growth.* 3. *Closure of Cecostomy.*—G. B., age 62, engine-driver. Admitted 27/11/09. Discharged 27/1/10.

Patient admitted with extreme constipation and swelling of the abdomen. Six months previously his illness commenced with an attack of severe abdominal pain, during which he passed no flatus or feces, but had some vomiting; subsequently the constipation gave place to diarrhoea, and he obtained relief. Since that time he had had frequent attacks of pain in the abdomen, accompanied by rumblings of wind, and his abdomen had swelled up very considerably. He had been troubled much with hiccough and eructations of gas, but had passed little flatus. Constipation had been marked since the first attack described, his motions being very small in calibre and in the form of pellets, while he had occasionally passed slimy material but no blood. He had lost a good deal of weight since the onset.

On admission patient was very ill, being emaciated and cachectic; pulse regular but soft; temperature, 98.6°; chest, clear.

Local.—Abdomen uniformly distended, flanks as well as anteriorly. The cæcum and ascending colon were easily recognised outlined through the belly wall, the contour of the latter varying in distinctness from time to time as they contracted. On palpation the colon could be easily felt when it contracted; this occurred intermittently. Succussion could be obtained in the cæcum, but no tumour or other mass could be felt in the abdomen. On percussion the whole belly was tympanitic, without flank dullness, the liver being displaced up above the costal margin. No gland was felt in the left posterior triangle at the neck.

Per Rectum.—The lower portion of the gut was felt ballooned, and the examining fingers could just touch a hard nodular mass, like a uterine cervix, high up in the bowel; its relations could not be made out, *i.e.* with regard to its fixity and extent, on account of its height.

Diagnosis.—Carcinoma of the upper part of the rectum, with chronic intestinal obstruction.

Operation—1/12/09. *Mr. Richardson.*—Small oblique incision made in the right iliac fossa. Abdomen opened and a large quantity of free fluid escaped. The cæcum was pulled out and sutured round to the wound margin. Bowel wall incised and Paul's tube introduced and fixed with silk. Distension relieved.

Subsequent.—Tube sloughed off on the 5th day; cecostomy looked well.

Second Operation—18 12 09. *Mr. Morison*.—Median infra-umbilical incision: abdomen opened. On examination a malignant growth was felt in the first part of the rectum, but no enlarged glands or deposits in the liver could be palpated. A small ($1\frac{1}{2}$ in.) incision was made in the left iliac fossa, opening into the peritoneal cavity. The sigmoid was divided above the growth, the upper end being closed and fixed in the left inguinal incision for permanent colostomy. The superior hæmorrhoidal artery was ligatured with the meso-rectum, and the growth with the sigmoid flexure and upper part of rectum resected. The cut lower end of the rectum was closed with 2 layers of sutures. The median laparotomy incision was closed in layers. Two days later the closed end of the sigmoid projecting through the colostomy incision was removed by the thermo-cautery and hæmorrhage thus avoided.

Subsequently the patient made a slow but good recovery from the resection, and except for the evident lack of fluid in his tissues, from the cæcostomy still open, he appeared fairly well.

Third Operation—15/1/10. *Mr. Morison*.—An incision was made round the margins of the cæcostomy opening and deepened down to the bowel. The skin edge and margin of the opening in the cæcum were invaginated into the bowel by interrupted catgut sutures, covered by lemberts. The wound in the belly wall was then closed as accurately as possible in layers, these being somewhat difficult to separate.

27/1/10.—The cæcostomy had not leaked since its closure and was then healed. The inguinal colostomy was acting well. The middle-line incision, which had gaped, was now clean, though there was still a fair area to granulate over. The patient's general condition had improved very much, and he left hospital feeling much better.

He returned at the end of September looking and feeling remarkably well.

CASE 28.—Malignant Growth of Sigmoid Excision—Permanent Colostomy.—J. M., age 64, widow. Admitted 8 7 10. Discharged 2 8 10.

Patient gave a 4 months' history of illness, being quite well previous to this. Her trouble began with the onset of pains, which resembled those of labour, only referred to the "back body"; they were intermittent, and the attacks lasted about 5 minutes. As the pain passed off the patient felt inclined to micturate and passed a good deal of flatus. Medicine gave her some relief.

Six weeks before admission the pain became more severe in character and was associated with vomiting, which gave some relief: rumblings were now much more evident with the pain.

During the last 3 weeks the pain had been aggravated still more and the rumblings more marked. The bowels were constipated. Enemas gave some relief to the symptoms, but these had continued more or less the whole time.

The only urinary trouble was the desire to micturate when the pain was present.

On admission patient looked older than her years, and had a drawn and pinched expression. Tongue moist, slight fur; temperature, 99°; pulse, 100, good volume.

Local.—Abdomen slightly distended; the enlarged transverse and descending colon could be outlined on the belly wall. There was some tenderness in the left iliac fossa, and distinct peristalsis could be elicited in the colon by massaging it.

Per rectum and per vaginam a hard nodular growth could be felt high in the bowel. No history of inability to pass flatus.

Diagnosis.—Cancer of lower end of sigmoid.

Operation—12/7/10. *Mr. Morison.*—Patient took the anæsthetic badly at first, but improved later. An incision was made in the left iliac fossa, parallel to Poupart's ligament, and extending from the anterior superior spine to within 1½ ins. of the symphysis pubis. On opening the abdomen and exploring the sigmoid a constricting growth was found, quite removable. The affected portion of bowel was drawn out of the wound and divided between clamps by the thermo-cautery, 2½ ins. on either side of the growth. It was excised with a considerable portion of mesentery. No enlarged glands were discovered. The distal end was completely closed by a continuous catgut suture, covered in by lemberts. The proximal end was drawn out of the wound and a Paul's tube inserted and fixed with strong silk. The descending colon was fixed to the belly wall by a continuous catgut suture on the inner side, and the rest of the wound was closed in layers, the deeper with catgut, the skin with silkworm.

Pathology.—The growth, as shown by microscopic examination, was "a carcinoma of the constricting variety," causing an annular stricture of the gut, so that the lumen would only allow of the passage of a penholder. The growth extended for 1 in. on either side of the constriction. No glands were discovered.

Subsequent.—Later in the day the patient complained of pain in the abdomen; the contents of the bowel were draining well by the Paul's tube; pulse thin and thready.

13/7/10.—Patient easier—still weak, stimulants ordered. Somewhat chesty.

17/7/10.—Paul's tube separated; patient much better; oil given; colon to be washed out.

2/8/10.—Wound quite healed; patient well; left hospital.

CASE 29.—*Cancer of Pelvic Colon.*—A female, aged 75, was admitted to the Royal Victoria Infirmary 20/8/10.

History.—Until 7 days before admission she was quite well. Whilst doing her work she was suddenly seized with a stabbing pain in her

abdomen, and vomited. Then her abdomen began to swell, and she had painful rumblings, loud enough to be heard in the next room. The bowels had latterly been very constipated, and she had had no motion since the attack commenced, though some flatus had been passed.

A year previously she had an attack of diarrhoea and passed slime but no blood.

She had never been jaundiced or had windy spasms.

On admission the patient looked fairly well; her tongue was moist and brown; pulse, 72; temperature normal.

The abdomen was generally distended, and the dilated tense caecum could be distinctly felt. During examination increased peristalsis was evident. Flatus passed after admission.

Per Rectum.—Marked ballooning of rectum, but no growth. Higher up a hard swelling could be felt through the rectal wall.

Diagnosis.—Cancer of pelvic colon.

Operation—25/6/10.—The abdomen was opened through an oblique incision in the left iliac fossa. A growth freely movable was found in the sigmoid flexure, 6 ins. from its termination in the rectum. No secondary deposits in the liver or elsewhere could be found. Above the growth the intestine was enormously distended. A loop of sigmoid above the growth was drawn out and opened and a Paul's tube was tied in.

The patient was entirely relieved by this operation, and slowly but steadily improved.

Second Operation—2/8/10.—Eight inches of the bowel, including the growth, the colostomy opening, and the corresponding mesentery, were excised, and end-to-end anastomosis was performed by the invagination method, *i.e.* by a tube tied in the upper segment and drawn down through the lower. The iliac abdominal wound was closed in 3 layers.

For the first 3 or 4 days the patient's progress was satisfactory, then her mind began to wander: finally she became restless and maniacal, and died 20/8/10 (18 days after the second operation).

Post-mortem examination, limited to the abdomen, showed that the abdominal wound was septic and infiltrated with pus. The omentum was firmly fixed over the operation area, and everything was so matted together that it was impossible to make any observation worth recording of the condition of the anastomosis. There were no glandular enlargements or secondary deposits.

CASE 30.—*Carcinoma of Lower Pelvic Colon—Resection—Anastomosis.*—Female, aged 42, admitted to private hospital 27/6/10.

History.—For 4 years the patient had had trouble with her bowels. Previous to this she was quite well. During the first 3½ years she had had attacks of pain with constipation, but in the intervals enjoyed

excellent health. During the last 6 months she had frequent cramping pain in the abdomen, with wind rumblings, had constipation alternating with diarrhoea, blood and slime in the stools, and had lost weight.

On admission she was a thin sallow woman, with tongue clean, temperature and pulse normal, and no sign of disease except in her abdomen. The abdomen was quite lax. In the left iliac fossa a well-defined hard sausage-shaped tumour, its long axis in the direction of the bowel, could be felt rolling under the examining fingers.

Diagnosis.—Carcinoma of the pelvic colon, causing chronic intestinal obstruction.

Operation—29 6 10.—A long oblique incision, extending from the anterior part of the left flank to the middle line in front, dividing the left rectus abdominis muscle and deep epigastric artery, gave an excellent exposure. The growth was found to be of the constricting type of carcinoma, and was situated at the lower part of the sigmoid flexure. Some enlarged glands were felt in the mesentery close to the bowel. There were no signs of secondary growth elsewhere in the abdomen. After mobilisation the lower half of the sigmoid with its mesentery was excised, and an end-to-end junction of the upper part with the rectum was made by the invagination method. The rectum and the mesentery of the pelvic colon were then sutured to the fundus of the uterus to give additional support to the union. The abdominal wound was closed in layers.

Pathologist's Report.—The tumour is a columnar-celled cancer, definitely infiltrating the submucous and muscular coats.

Nine days after operation the bowels were moved normally, and the tube was evacuated. Recovered.

CASE 31.—*Carcinoma of the Pelvic Colon forming a large Pelvic Tumour.*—Female, aged 45, married, was admitted 1/10/10.

History.—Five months ago her illness began with an attack of acute intestinal obstruction, which was followed and relieved by diarrhoea. Since then she had not been well and had constant diarrhoea, sometimes blood in the motions, and painful micturition. Menstruation, previously regular, had ceased for 2 months.

On admission she looked ill, pale and sallow; tongue moist and clean; pulse, 96; temperature, 99·6. Her urine contained albumen.

The abdomen was distended below by a large firm mass with a smooth surface and well-defined rounded edges, fixed in the pelvis below, but with a limited side-to-side movement above. There were no signs of free fluid. Per vaginam the uterine cervix was pointing backwards and was somewhat fixed. The left fornix was pushed down and Douglas's pouch was occupied by a hard tumour pushing the uterus backwards and to the right. The impression conveyed to

the fingers was that the lower segment of the uterus was fixed in cement.

Diagnosis.—Large left malignant ovarian cyst filling the upper part of the pelvis, with infiltration and inflammation of the lower portion.

Operation.—18/10/10.—The abdomen was opened in the middle line below the umbilicus, and the patient was placed in the Trendelenburg posture. Coils of small intestine were adherent over the top of the tumour, and in separating these and drawing up the mass a coil of infiltrated small intestine was torn. The diseased portion (4 ins.) was resected and an end-to-end anastomosis made with an inner through-and-through continuous catgut suture and an outer row of interrupted silk lembert sutures. A further attempt to remove the tumour showed that it consisted of an inseparable conglomerate mass, consisting of ovaries, tubes, broad ligament, uterus and intestines, and irremovable. Before closing the abdomen an enema was administered and some of it escaped into the pelvis, showing that the large bowel had been opened. The opening was small, low down, and inaccessible. Some iodoform paste was smeared over the position indicated by the escape of fluid, the omentum was tucked down over the opening and a drainage tube extending into the pelvis was left in the lower part of the wound, and a large indiarubber tube was left in the rectum and sutured to the anus. Four days later there was a fecal discharge from the abdominal wound. Inguinal colostomy was advised, but refused, and the patient went home. Recovered. At home the wound and fecal fistula closed for a time, then it broke down again, and the patient died 6 months after the operation.

CASE 32.—Microscopic Report “Columnar-celled Cancer”—Malignant Growth in Sigmoid Flexure of Colon—Vesico-Colic Fistula—Colostomy—Death.—T. O., age 53. Admitted 11/6/10. Died 20/6/10.

Patient admitted with a history of illness of 9 months' duration. He had complained of pain in both iliac fossæ, painful wind rumblings and frequency of defecation, his bowels being moved about 6 or 8 times daily. The motions were unformed and offensive, and latterly he had passed white slimy material from the rectum. During the last three weeks he had been confined to bed, and had had 4 rigors. Three days before admission he began to pass flatus per urethram, and had increased frequency of micturition, with pain along the urethra during the act. The urine was very thick and offensive. During the last 3 days also the motions had been darker in colour, and there had been some attempt at formation. He had lost 1 or 2 stones in weight during the last few weeks. He had never been abroad. He had previously been treated as a case of “mucous colitis.”

On admission patient was feeble and emaciated: tongue moist and

furred; teeth, false; pulse, 128, regular, small volume, low tension; temperature, 99·5° F.

Local.—No abdominal tenderness. He held himself so rigid that palpation was difficult. In the upper part of the left iliac fossa a mass could be felt on the posterior abdominal wall, which was thought to be large bowel. Per rectum there was ballooning, and on the anterior rectal wall above the prostate an indefinite mass could be felt, suggestive of an inflammatory condition. Faecal matter was present in the urine.

14/6/10.—Patient was passing a great deal of flatus per urethram, which caused him intense agony, while particles of faeces continued to be present in the urine.

Diagnosis.—Sigmoido-vesical fistula due to abscess in connection with a sigmoid sacculus.

Operation.—15/6/10. *Mr. Morison.*—Median incision, the umbilicus being excised. Patient took the anæsthetic very badly, and his rigid belly wall gave great trouble to the operator. The appendix was pathological; its tip was bulbous and there were numerous adhesions around it. Appendicectomy was performed, the stump ligated, carbolised, and invaginated. In the neighbourhood of the division of the left common iliac artery a hard mass was found, which could not be definitely stated to be growth or inflammatory. Numerous coils of rather collapsed small gut were adherent to it. It was considered injudicious to separate these, and so the following procedure was adopted:—The sigmoid was divided above the mass, both upper and lower ends being closed; the upper end was brought out through a separate oblique incision in the left iliac fossa, the lumen being left obliterated. The median incision was closed in deep layers of catgut, the skin being sutured with silkworm gut; the bladder was thoroughly irrigated and soon washed clean. Paul's tube was fixed into the proximal gut. The bladder was subsequently irrigated twice daily.

20/6/10—(5 days after operation).—The patient was never fit after operation, and died in a condition resembling uræmia. Very little faecal matter had passed through the Paul's tube.

Post Mortem.—A mass of porridge-like faeces was found in the cecum and ascending colon. There was a malignant growth of the sigmoid and a fistula between the intestine and upper part of the bladder, to which area many coils of small intestine and also omentum were adherent. The kidneys appeared to be normal. There was no peritonitis, no evident sepsis, and no discoverable surgical cause of death.

CASE 33.—*Multiple Rectal Polypi—Colostomy.*—J. R., age 13, school. Admitted 11/4/10. Discharged 19/5/10.

In August 1908 Mr. Richardson removed a polypus from the

rectum, after which he was well for some time. However, his old symptoms recurred, and might be shortly stated as follows:—He had *no pain* with defaecation. He sometimes had a profuse *discharge of bright red blood* on having his bowels moved, and this recurred from time to time. He had sometimes to be carried from the lavatory, quite collapsed from loss of blood. His *motions* were well formed and natural, except when the presence of blood altered their appearance. *Something frequently came down* after defaecation, and this had to be replaced.

On admission his general condition was good: temperature and pulse normal; chest clear.

Local—Per Rectum.—Numerous sessile papillomata could be felt situated all over the mucous membrane and varying very considerably in size; they extended as high as the finger could reach.

Sigmoidoscopy—14/4/10. *Mr. Hamilton Drummond.*—Numerous sessile papillomata could be seen, varying in size from a pea to a cherry, extending the whole length of the rectum, with very vascular tops, presenting a bright red appearance; none were demonstrable in the pelvic colon, and so apparently they were limited to the rectum.

Operation—19/4/10. *Mr. Morison.*—Left inguinal colostomy, first stage, performed. Loop of sigmoid pulled out and fixed with a clip through its mesentery; no sutures introduced and the bowel not opened.

20/4/10.—Bowel opened longitudinally; clip removed. Both colon and rectum washed out daily with saline.

19/5/10.—Bowels were being opened twice daily through the colostomy; occasionally a little faecal matter escaped per anum with the lavage. The colostomy opening to be left for 12 months, to prevent the irritation of the faeces passing over the papillomata with the hope of cure.

Readmitted—19/5/11.—Since his operation his general condition had been greatly improved. He had had no hamorrhage from the rectum, and had been able to play football. The bowels were opened by the colostomy about twice daily.

On admission he looked physically fit. There was some prolapse of mucous membrane through the colostomy opening. *Per rectum*, on digital examination, no polypi could be made out, but little definite could be ascertained on account of some putty-like faeces which was present. Repeated enemata failed to clear this away, and it had ultimately to be removed by digital means. Sigmoidoscopy now showed an entire absence of polypi, but there were one or two small areas, like raspberry nodules, in the region where the polypi had been. Whether these were the last signs of polypi or were dependent on the presence of faeces for their existence could not be settled. The sigmoidoscope was introduced for 8 ins. It could not be inserted

from the colostomy opening on account of the smallness of its size. On digital examination a few very small hard nodules, like split peas, could be felt, apparently in the rectal wall. Whether these were remains of old polypi was not certain, but it was decided to postpone closure of the colostomy a little longer, in order that they might be given a chance of disappearing.

CASE 34.—*Colitis with Ulceration and Polypi—Cæcostomy—Death.*—H. B., age 27, married. Admitted 21/1/10. Died 28/1/10.

Patient admitted complaining of the passage of blood and slime per rectum, accompanied by pain.

Her illness began 5 years ago, after the birth of a child.

Pain.—Varied from time to time, at intervals being very bad. It had been worse during the last 2 weeks, spasmodic and shooting in character and accompanied with the desire to have the bowels moved. On attempting to defæcate there was frequently only a *discharge* of blood and mucus, while with every motion these were present, but not in any great amount at one time. She had been confined to bed and was very ill for the last month.

Stool.—She complained of constipation as a rule, not considering the discharge a motion; with the latter there was really diarrhoea. She had had to be careful with her diet for the last year, chiefly avoiding meats, pastry, and green vegetables: eggs and milk suited her best.

Anything coming down?—From the onset, with straining, the back-body came down, but this was considered to be nothing more than piles.

On admission she was a thin, anæmic, very ill-looking woman. Breath, very foul; temperature, 99.6°; pulse, 100.

Local.—The abdomen looked normal. There was tenderness over the cæcum, and a sausage-shaped tumour could be felt in this situation, like the bowel. Nothing else was to be felt.

Per Rectum.—Small hard papules could be felt scattered all over the rectal mucous membrane, varying in size from a pin-head to a pea.

Sigmoidoscopy.—Red raised areas could be seen on the mucous membrane surrounded by superficial ulceration: these areas were the papulae felt. The condition extended right up into the pelvic colon, and only the lower part of the latter could be examined from the presence of blood and mucus, apparently coming down from above. The whole bowel seemed much thickened.

Diagnosis.—Multiple sessile polypi, with ulceration. Extensive ulceration, leaving areas of mucous membrane; cause unknown.

Operation—25/1/10. *Mr. Morison.*—Cæcostomy performed in the usual way and Paul's tube inserted. The cæcum appeared normal.

28/1/10.—Patient gradually sank, making no improvement, and died.

Specimen obtained post mortem showed the whole rectum, pelvic, descending and half the transverse colon to be the seat of disease. The lower in the bowel the worse the disease appeared, and the rectum and pelvic colon were studded with what appeared to be multiple polypi, and here the disease was worst. Higher up the bowel the appearances were more of those multiple small ulcers.

Microscopic Report.—"The whole condition is one of chronic inflammation with ulceration, and certainly not due to either new growth or tubercle."

CASE 35.—*Sigmoido-Vesical Fistula due to Sacculated Sigmoid*.—Female, aged 61, married, admitted to private hospital 31/8/10.

History.—This was indefinite. All that could be elicited from the patient and her husband was that she had been constipated, and 7 or 8 years ago noticed flakes in her urine, but only at times. Sometimes increased frequency of micturition occurred and the urine was very offensive in smell and dark coloured. Occasionally clots of blood were passed, causing great pain. The condition had apparently caused very small trouble.

On admission the patient was a very stout, healthy, though somewhat pale-looking woman. Her doctor had sent along with her a sample of her urine, which contained gross faecal matter.

In the hypogastrium to the right of the middle line an ill-defined tender mass was discovered on palpation. Per vaginam the uterus was fixed posteriorly by hard exudate in the pouch of Douglas. Except for the faecal contents there was little found in the urine, and the amount of urea passed in 24 hours was normal.

Cystoscopic examination (Mr. Willan) showed a circular opening large enough to admit a lead pencil behind the left ureteric orifice at the junction of the left lateral and posterior walls on the base of the bladder. The rest of the bladder was normal. It was difficult to keep the bladder distended for cystoscopic examination as the fluid escaped into the rectum and ran out of the anus. Sigmoidoscopic examination revealed nothing.

Diagnosis.—Sacculitis of sigmoid with ulceration, adhesion to bladder and fistula.

Operation—10/8/10.—The abdomen was opened in the middle line below the umbilicus. There was considerable matting of intestinal coils, which were firmly adherent in the pelvis. It was finally determined that a loop of the ileum and a portion of the sigmoid flexure low down were firmly adherent to the bladder wall. In separating these adhesions the fat and brittle mesentery of the small intestine was separated for a considerable distance from the gut, and the adherent sigmoid was torn completely across.

The lacerated portion of sigmoid was resected and the upper end

was invaginated into the lower by a tube fixed into the upper and passed from above through the rectum and anus. Nine inches of the damaged ileum close to the ileo-cæcal valve were next resected, the cut ends were closed, and a lateral anastomosis was made with a Murphy button (any other means of making the anastomosis would have been exceedingly difficult, as the intestine was so small and was buried in a very fat mesentery). The hole in the bladder was then carefully closed by interrupted silk sutures. (On account of the depth of the pelvis and the fat patient this was a very difficult proceeding.) The pelvis was drained through a hole made at the bottom of Douglas's pouch into the vagina, a catheter was fixed into the bladder, and the abdomen was closed with 3 tiers of suture.

Towards the end of the operation 2 pints of saline were given intravenously.

The operation occupied $2\frac{1}{2}$ hours, and was the most arduous I have undertaken or seen.—R.M.

Recovery was delayed by suppuration and the formation of a faecal fistula.

Discharged 20/11/10. Well.

CASE 36.—*Gastrocolic Fistula*.—Male, aged 39, was admitted to private hospital 23/11/10.

History.—The patient was quite well till 5 months ago, when he began to have a feeling of fulness in the stomach and to lose flesh.

About the middle of September (2 months ago) he felt a "boiling" sensation in the stomach and made himself sick to obtain relief. He vomited about 2 pints of foul material which smelt and looked like faeces.

Ten days ago he experienced the same symptoms and vomited as before.

The day before admission his doctor had washed a quantity of foul faecal-smelling material out of his stomach.

There had never been acute pain in his stomach, but there had often been a dull ache.

Lately he noticed that his bowels had been moved 3 times daily, in fact after every meal, and he had been surprised at the size of his evacuations. He had never noticed food in the motions. His appetite had been, and still was, enormous.

On admission the patient was a pale, thin man, full of energy and hope; tongue, clean; breath, foul and faecal; temperature and pulse normal.

On examination of the abdomen there was marked epigastric rigidity, especially on the left side, and local tenderness over the upper left rectus. No mass could be felt. Nothing abnormal elsewhere was discovered. A bismuth meal was given to him, and its

progress was watched by Mr. Hamilton Drummond by X-ray through a screen, with the patient standing up. First the stomach was seen to be distended by the meal, then almost immediately it was seen to escape into the colon to the right of the splenic flexure. Colon peristalsis was quite plainly visible. Within half an hour, on his return to the hospital, an enema was administered, and the greater portion of the bismuth porridge was passed with it.

Diagnosis.—Gastrocolic fistula due to a malignant growth connecting the stomach and transverse colon.

Operation.—31 11 '10.—The abdomen was opened in the middle line above the umbilicus. There was an extensive and inoperable malignant growth of the stomach, chiefly on its posterior wall, to which the transverse colon was firmly attached. Recovery.

CASE 37.—*Ulceration and Stricture (Malignant?) of Colon—Recto-Vaginal Fistula.*—Female, single, aged 36, was admitted to private hospital 10/10/10.

History.—All her life she had been much troubled by constipation. Sixteen years ago she contracted "dysentery" after a chill caught whilst sea-bathing. Since this attack her bowels were so loose that if she wished to go anywhere she had to take a sedative, the effect of which lasted for 6 hours. In June 1910 (4 months ago) she began to have spasms of pain across the abdomen, which lasted for 1 or 2 hours. Two months later these became very severe, were accompanied by vomiting, and lasted for about 18 hours. Six weeks ago she had intense pain, diffused over the lower abdomen and extending into the left groin and the vagina. She was also troubled with hæmorrhoids. After 10 days of suffering she felt something burst and there was a free discharge of blood and pus from the vagina. The pain was relieved but a profuse discharge continued. Fæces then began to appear in the discharge, and finally for a week before her admission all the fæces escaped through the vagina, nothing coming from the anus.

She had lost weight and had been unable to sleep without an opiate on account of the pain and discharge. Menstruation ceased 3 months ago.

On admission her general condition was poor. Temperature, 100 : pulse, 100.

The abdomen was not distended, and palpation only discovered some tenderness in the left iliac fossa. Under an anæsthetic the rectum was found to be extensively ulcerated, from the anus as far as could be reached. A large hole admitting the tip of the index finger communicated with the vagina just above the anus. The vaginal wall presented a large ulcer, with hard undermined edges extending upwards on the left and undermining the labium minus.

Diagnosis.—Ulcerative colitis, with stricture and partial obstruction.

Operation—12 10 10.—The abdomen was first opened by an oblique incision in the left inguinal region. The sigmoid flexure was bound down by adhesions thickened, contracted, red, and covered by excrescences like the comb of a cock. (One of these was removed for pathological report.) The remainder of the colon was next explored, and it was found to be in a similar condition though less in degree throughout. A second oblique incision was made in the right iliac fossa over the cæcum. It was seen to be reddened and thickened, and felt hard and oedematous. The vermiform appendix was much thickened, distended, and obviously diseased. It was excised. The cæcum was then fixed to the abdominal wall (first stage of cæcostomy).

Pathologist (Professor Stuart McDonald) reported:—

1. Of the anal ulcer.—“This appears to be a simple ulcer. There is nothing to suggest malignant disease or any of the infective granulomata.”

2. Of the appendix.—“It shows chronic inflammatory changes in the wall, with lymphocytic infiltration of muscular and epithelial coats.”

3. Peritoneal nodule.—“This shows a group of tubular glands. The tubules are lined by tall columnar cells, among which some goblet cells are present. The stroma is cellular and vascular. If this nodule came from the peritoneal coat of the intestine I cannot explain the appearances, except on the hypothesis of a secondary deposit of columnar-celled cancer.”

Four days later the cæcum was opened to establish an artificial anus. Secondary hæmorrhage occurred several times from the cæcostomy wound, but ultimately ceased. The improvement in this patient's condition was remarkable, though it was very soon impossible to wash the colon from the cæcostomy wound to the anus or *vice versa*. She returned home 9 12 10. Recovered, to return in 1 year for consideration of the question of colectomy.

CASE 38. — Ruptured Duodenal Ulcer and General Peritonitis — A Diagnosis of Intestinal Obstruction.—A male, aged 39, was admitted to the Royal Victoria Infirmary 7/7/10.

The patient was sent into the infirmary as an emergency case, suffering from “retention of urine.”

History.—His illness began a month ago with loss of appetite, and he had lived on fluid foods. A week later he felt a gnawing pain in the stomach while he was at work. He went home, had tea, and afterwards vomited.

Since then he had had pain in the abdomen more or less constantly, varying in severity, at times bad enough to make him stop work. He vomited about once every day, a fairly large quantity, sometimes bile-stained; it relieved the pain for a time. In addition to the vomiting he was troubled a good deal with acid eructations. The relation of pain

to his meals was indefinite, as he was only taking fluids. During the past week he had passed little urine, and had considerable pain with micturition. Three days before admission he had an acute exacerbation of pain; it remained worse than before. Two days before admission he developed complete retention, for which a catheter was passed. During the last 2 days he had passed no flatus or fæces, and had eructated much gas.

He said that he had had many similar attacks to the last, but with each successive one his symptoms had been worse.

On admission he walked in, but with difficulty, and appeared to be very weak. He was pale and anxious-looking, much emaciated: temperature, 100° F.: pulse, 110. The abdomen was distended and tense. No peristalsis was seen, no rumblings heard, and no mass felt. On percussion there was considerable dullness over the pubes, but the remainder of the abdomen was tympanitic. After passing urine, which he did unaided, the suprapubic dullness did not disappear, and as it was doubtful whether the catheter used had entered the bladder, because there were several false passages, an aspirator needle was introduced into the dull area and about 1 dr. of fluid with a urinous smell withdrawn. Subsequently the patient passed his urine naturally, but neither flatus nor fæces.

9 7 10.—Patient passed a little flatus for the first time since admission. The distension of his abdomen was less. Nothing could be felt except that both recti muscles were rigid. His general condition was very feeble, and he was pained and sick. A pint of black watery fluid without fæcal odour was washed out of his stomach.

Diagnosis.—Intestinal obstruction, with peritonitis.

Operation.—9 7/10.—On opening the abdomen the pelvis was found to be filled with purulent dirty-looking fluid. The whole of the small intestines were red and distended, and covered with purulent lymph. The cause of this was found to be a ruptured duodenal ulcer, about $\frac{1}{4}$ in. in diameter, immediately beyond the pylorus. The duodenal opening was closed by a double layer of sutures, the abdomen thoroughly flushed out with normal saline, a drainage tube left in above the pubes, and the abdominal wall closed in layers. During the operation 2 pints of normal saline were introduced into the circulation through the median basilic vein.

For the first 3 days after operation the patient made such satisfactory progress that his recovery was anticipated. On the evening of the third day (12 7/10) he became restless, then delirious, and his pulse and temperature, which had dropped to normal, rose to 140 and 100·4 F. respectively. A submaxillary gland next swelled, and a week later an abscess was opened under a local anæsthetic. Then his breathing became embarrassed, and he died on the evening of 21 7 10 (12 days after the operation) of pneumonia.

Post-mortem examination showed that his death was due to septic broncho-pneumonia. His abdominal condition, except that there were traces of lymph here and there on the intestine, presented nothing abnormal.

CASE 39.—*Appendix Abscess which had leaked into the Cecum, leaving a Hard Mass simulating Ileo-Cæcal Cancer.*—J. M., age 63, dealer. Admitted 18/2/10. Discharged 4/3/10.

Three weeks previous to admission patient had a single attack of pain in the upper abdomen after a heavy meal, and was blown up with wind. He vomited and obtained relief, and remained well for a week. At the end of this time he felt poorly all day, and by 2 A.M. he had developed a very severe pain in the abdomen, diffuse and continuous: he did not vomit. The following day the pain settled in the right iliac fossa, and he was subsequently tender to examination in this region. His doctor told him "something had formed." The pain gradually decreased in severity, and at the time of his admission he had not any, and was only complaining of a feeling of weight in the right lower abdomen. He had had no trouble with micturition. His bowels had been somewhat constipated, but had been moved by enema 2 days after the acute attack. He had had no diarrhoea, and had noticed no blood in the stools. In addition, there had been no rumblings in his abdomen, and he vouched that he was always able to pass flatus. There was no history of any previous attack. He was rapidly losing weight.

On admission patient was in fair condition; temperature and pulse normal; chest clear.

Local.—Abdomen quite lax; small mass felt in the right iliac fossa, only slightly tender on pressure, hard, nodular, and somewhat movable. The resonance in this region varied, and a thrill, obtained by flicking the belly wall, was put down to the laxity of the parietes. There was no liver enlargement, and no other mass was felt in the abdomen, nor could glands be felt in the left posterior triangle of the neck. Per rectum, no mass felt bimanually; prostate considerably enlarged.

Diagnosis.—From the age of the patient and the nature of the mass felt it was decided to be a case of ileo-cæcal carcinoma, the alternative diagnosis being that of old appendix abscess.

Operation—22 2 10. *Mr. Morison.*—Usual appendix incision: belly muscles divided. They showed marked œdema. On opening the abdomen there were present some omental adhesions to the anterior belly wall. The appendix was found wrapped round by, and buried in, inflamed omentum. On separating this the remains of an old abscess between the appendix, omentum, and mesentery of the ileum were exposed. The cæcal wall was thickened and œdematous, and showed a small hole, which, however, did not communicate with the lumen of the gut, but which was considered to

be the seat of discharge of the abscess into the cæcum. The appendix exhibited a very bulbous tip, and the remainder of it, which was very long, was shelled out of a thick oedematous peritoneal coat, and removed in the usual way. The thickened coat and omentum were sutured over the stump, and the abdominal wound closed in layers without drainage.

4/3/10.—Uninterrupted recovery; patient left hospital healed and quite well.

At a meeting of the Royal College of Surgeons of Edinburgh the following gentlemen, having passed the requisite examinations, were admitted fellows:—

W. Ainslie, M.B., Ch.B., Edinburgh; R. C. Alexander, M.B., Ch.B., Edinburgh; J. S. Beedie, M.B., Ch.B., Turriff; W. R. Cammock, M.B., Ch.B., Rutherglen; T. Gilray, M.B., Ch.B., Wellington, N.Z.; T. A. MacGibbon, M.B., Ch.B., Hawera, N.Z.; E. R. D. Maconochie, M.B., Ch.B., Edinburgh; R. Morison, M.B., Ch.B., Edinburgh; M. C. F. Morkane, M.B., Ch.B., New Zealand; C. D. Muir, M.B., Ch.B., Glasgow; A. F. H. Rabagliati, M.B., Ch.B., M.D., Yorks; H. J. Roberts, M.D., M.R.C.S.(Eng.), Penygroes, North Wales; B. L. Thurlow, M.D., M.B., Ch.B., Tunbridge Wells, and H. J. Walker, M.R.C.S.(Eng.), L.R.C.P.(Lond.), Brighton.

The following candidates passed the final examination and were admitted L.R.C.P.E., L.R.C.S.E., and L.R.F.P.&S.G.:—Ida M. Bernard, Russia; L. C. E. Beroard, Canada; J. A. Hutchinson, Co. Derry; H. B. Henriquez, Buff Bay, Jamaica; V. M. Patel, Bombay; H. M'Intyre, Largs; C. B. Robinson, Yorkshire; E. J. Fisher, Nairn; E. C. A. Smith, Bellary; A. S. Mackenzie, Australia; P. G. Phillips, Sevenoaks; S. D. Ratnagar, Bombay; N. Sydney-Williams, Jeypore, Rajputana; M. R. Kochhar, Cujrat, India; J. H. Appoo, Bombay, India; A. Young, Edinburgh; R. M. M. Wilson, Victoria; V. C. Logan van Someren, Australia; S. Jesudason, Palamcotta, S. India; M. C. Anderson, Edinburgh; T. J. Enright, Ardagh, Co. Limerick; C. E. H. Smith, Ireland; D. J. Hickey, Co. Cork; P. A. Dastoor, Bombay; and C. J. Evans, Co. Cork; and 9 passed in Medicine and Therapeutics, 4 in Surgery and Surgical Anatomy, 17 in Midwifery, and 16 in Medical Jurisprudence.

CLINICAL RECORD.

ANEURISM OF THE THIRD PART OF THE LEFT SUBCLAVIAN ARTERY TREATED BY ANEURISMORRHAPHY.

By J. HOGARTH PRINGLE, M.B., F.R.C.S.,
Surgeon, Glasgow Royal Infirmary.

A WOMAN, æt. 33, was admitted to my ward on 11th May 1910, complaining of numbness down the left upper extremity, and of a swelling in the left side of her neck.

Beyond the acute diseases of childhood and an anæmic condition at the age of nineteen she had always had good health. Has been married for six years, but has never been pregnant. No history and no evidence can be obtained of specific disease.

About two months previous to her admission she became aware of a swelling above the left clavicle, and since then has had a feeling of numbness down the left upper extremity, especially noticed after any exertion; she has moreover been disturbed by the pulsations of the tumour.

For about two months prior to the discovery of the swelling she had been nursing a relative, and although this entailed some hard work, she is not aware of having strained herself during this or at any other period. The family history is unimportant.

The patient is a well-developed woman; her heart, lungs, and kidneys all seem to be normal. Just above the middle third of the left clavicle there is a rounded tumour, about the size of a pigeon's egg, in the posterior triangle of the neck. It pulsates visibly, and the pulsations are of an expansile character. The tumour extends from the outer border of the left sterno-mastoid muscle and dips beneath the clavicle, so that its lower limit cannot be determined. A systolic bruit can be heard over the tumour on auscultation, and a faint thrill can be felt by palpation. The pupils are equal and medium in size, and active: the left radial pulse is feebler than the right, but no thickening of the arterial coats can be made out. There is no anaesthesia in any part of the limb.

There was no doubt about the tumour being an aneurism of the third part of the left subclavian, and it presented all the appearances of being "sacculated."

The patient was kept in bed and given grs. xv. of iodide of potassium three times a day. On 15th May I introduced two of Sir William Macewen's aneurism needles into the sac, one at the upper portion and the other as far down, distally, as possible, and by means of these scraped the interior of the sac at as many points as could be reached, and then left them in the sac for a period of one hour, to be swayed by the blood current and so keep up a gentle irritation of the sac wall, as recommended by Macewen. At the end of an hour, when the needles were withdrawn, the patient's left upper limb was placed upon a Middeldorpf's splint. On 20th May the consistence of the tumour was decidedly firmer, and the tumour itself was distinctly smaller, and its pulsations much less marked, and on 25th May this change was still more obvious. The limb was kept fixed in the splint until 6th June. From that date the patient was allowed to have it supported in a sling until 27th June, when it was left free altogether, the tumour at that date being still smaller and firmer. From this date, apparently after the patient was allowed the use of her arm, the size of the tumour gradually increased again and the pulsations became more vigorous, and, in consequence, on 5th July the sac was "needled" again, in the same manner as on the former occasion, and on 8th August it was needled again. The patient was dismissed on 18th August with her arm in a sling, the tumour being decidedly smaller, and apparently firmer, than when she was first seen. She went out with the intention of coming back later for further treatment, but for various reasons was unable to do so until the end of January 1911, when the tumour appeared to be much the same as it was when she was first seen.

The aneurism seemed to be one that was suitable for treatment by suturing the sac, and I had decided upon carrying out this method. On 5th February, while examining again the region of the sac, I detected for the first time what appeared to be a cervical rib on the left side of her neck, the extremity of which was felt immediately below and on a plane just anterior to the aneurism. I could not make out anything of the kind on the right side, but an X-ray plate exposed after this date showed a fairly well developed rib attached to the left seventh cervical vertebra and a very slender one on the right side as well.

15th February 1911. Operation was carried out to-day by an incision over the prominence of the tumour parallel with the upper border of the clavicle and rather above its level. I first removed

the cervical rib, and to do so was obliged to make a second incision upwards, at right angles to the former one, in order to gain more room, and, after freeing the rib from the structures around and over it, was able to divide it at the transverse process of the seventh vertebra. This gave fairly free access to the aneurism, but it was not possible to reach its lower limit, which extended beneath the clavicle. The latter was therefore divided about its middle, and after the subclavius muscle was cut through the outer half of the clavicle was pulled outwards and the aneurism completely exposed. It was now found to be a fusiform aneurism that was becoming sacculated at its proximal part, which was placed rather internal to the outer border of the scalenus anticus. The suprascapular artery was preserved uninjured.

The upper cord of the brachial plexus and the suprascapular nerve were very closely adherent to the posterior aspect of the sac, and were dissected off for a short distance to permit of a clamp being applied to the artery proximal to the sac. A strong silk ligature was placed round the artery distal to the sac but not tied, in the hope that, by traction upon the ligature, the artery could be compressed sufficiently to prevent any reflex hæmorrhage occurring. The sac was then opened from end to end. Its wall was very thin, and it contained practically no clot. The ligature as a traction thread had no effect upon the rather free hæmorrhage from the distal opening of the artery, and another clamp had to be applied to the vessel distal to the aneurism. The sac was then sutured up with several layers of sutures of fine silk in a fine bowel needle. When these sutures were completed and the clamps removed there was no bleeding at all. The clavicle was wired and the skin wound sutured. The arm, after being wrapped up in cotton wool, was kept supported upon a pillow. The patient made an excellent recovery; she never had any subjective disturbance, and the pulsations of the left radial artery were felt at the wrist on the 17th, two days after operation. She was allowed out of bed on 8th March, and went home on 18th March 1911, up to which date I had not been able to recognise, by palpation, the presence of the cervical rib on the right side which had been shown in the X-ray plate.

She was seen again on 13th April 1911, when she was very well. There was complete absence of any pulsation over the third part of the left subclavian artery, and a fair pulse could be felt in the left radial. The clavicle was strongly united, and she

had good use of the left upper limb. It was possible on that occasion to feel the right cervical rib as a narrow resisting structure in the substance of the muscles.

I publish the notes regarding this patient as it seems desirable that all cases in which this method of treatment is adopted should be put on record.

Although Matas first obliterated an aneurism by suturing the sac in 1888, he does not appear to have recorded the fact until 1902, when he reported five cases in which the method had been adopted.

In 1910 he was able to collect from the literature 149 cases in which one or other of the methods of treatment that he has suggested had been carried out; out of this total of 149 there were only five instances of gangrene supervening. I do not find stated in this list of Matas' the actual number of patients in whom secondary hæmorrhage followed the operations, but in a former list of 85 cases, reported in 1908, there were only two cases of secondary hæmorrhage.

The advantages claimed for the oblitative closure of an aneurismal sac are—(1) that hæmostasis is perfectly secured, as the actual orifices of the main vessel and of any branches that may arise from the sac itself are closed at the sac; (2) that the collateral circulation will suffer less in consequence of the sac being completely emptied, and therefore the pressure that, in its distended state, was exerted upon (*a*) the collateral arteries and (*b*) the veins is lessened; (3) that the perisaccular structures are subjected to the least possible amount of traumatism.

While the operation of ligation of the subclavian artery in its first or second portions was formerly a disastrous one, great improvements in the results of operative interference by ligation have been obtained since the antiseptic era began. Thus Jacobsthal, in 1903, recorded all the cases he was able to collect that had been operated upon by ligation or extirpation of the sac between 1890 and 1903, 25 in all; and of these 17 were cured and 4 patients died, a mortality of 16 per cent., whereas out of 75 cases operated upon prior to 1890 (pre-antiseptic) there were 55 deaths, a mortality of 73 per cent.

Savariand, Monod, and Vanwerts have, since the publication of Jacobsthal's paper, collected and recorded 78 cases treated by ligation, incision, or extirpation of the sac, with a mortality of 14·5 per cent.

In spite of the very great improvement in the results of the

older methods of treatment which these statistics show, the method of obliterative endoaneurismorrhaphy seems to me to hold out a better prospect in these most important cases. It appears to me that the claims put forward by Matas regarding the lessened interference with the collaterals and the venous circulation are sound ones, but it would also appear that this method preserves the vasa vasorum of the arterial coats when they persist, or any vessels that might enter an adventitious sac, so that no dead tissue or a tissue deprived of its vascular supply is left, as must always be the case when any portion of the arterial coats remains strangled by a ligature, whether the sac be excised or not, and that this factor is probably one of extreme importance in diminishing the risks of secondary hæmorrhage.

Obliterative aneurismorrhaphy seems to be preferable to Matas' "reconstructive" method of treatment; *à priori* one would think that the attenuated wall of a vessel at the site of a fusiform aneurism is not suited to resist the full force of the blood-stream normal to the artery which is the seat of the aneurism, and that a secondary dilatation might be expected, and this has actually happened in several of the cases recorded—4 out of 13 (Matas' list of 1908).

In the case now recorded the reconstructive operation might easily have been carried out, but the walls of the aneurism were so thin that I felt, at the time, that it would only be courting a failure to attempt it.

MEETINGS OF SOCIETIES.

Edinburgh Obstetrical Society.

THE eighth meeting of the session was held on 12th July, Dr. Haultain, President, in the chair.

Professor Wertheim, Vienna, and Professor Döderlein, Munich, were elected honorary Fellows of the Society.

Specimens were shown by the President, Dr. Haig Ferguson, Dr. Fordyce, and Dr. Scott Carmichael.

Dr. Berry Hart read his paper entitled "A Contribution to the Theory of Enzygotie (Monochorionic) Twins." By enzygotie twins one understood twins developed from one zygote (fertilised ovum). The most striking instance of these were identical twins, where the similarity was complete, even to the finger prints (Wilder). It was further noteworthy that all twins derived from one zygote were of the same sex. In what were termed allantoido-angiopagus twins there was

a communication between the umbilical cords, and one twin was usually deformed. The deformity was often a striking one, and the head, trunk, or limbs might be wanting, or the only representative of the body systems might be the head. Sometimes one twin might be represented by a few bones and tissue. Such twins might be united at the thoracic or pelvic region and occasionally by the head. In considering the causation of such anomalies, the author advanced the theory that one must go back to the zygote itself, and, looking on it as containing the determinants for the organs of the developed infant, suggested that in enzygotic twins there might be a complete or incomplete doubling of the determinants, and then a complete segregation of these into two groups. In identical twins the doubling and segregation were complete; in the other deformities the doubling was incomplete. Segregation thus gave a complete twin and an incomplete one. Thus if an acephalic twin was present along with a normally developed one, the determinants for the head were not doubled and thus the acephalic result on one side.

The paper was discussed by Dr. Ballantyne, Dr. Fordyce, Dr. Watson, and Dr. Ritchie.

Dr. H. M. Church read a paper on the subject of "Mongolism," and related the case of a Mongol girl who was born of a primiparous mother, both parents being young and healthy and having a subsequent family of three healthy boys. Mongolian primiparous birth was very rare, and was considered to be due in this case to a traumatic shock—a bicycle accident to the mother about ten days after conception. Mongols sometimes appeared at the climacteric period of life. There could be discovered in the case no parental alcoholism, syphilis, or tuberculosis. The importance of protecting an expectant mother from all bodily and mental shock throughout the whole of pregnancy, but especially during the early weeks, was evident. Dr. Church referred to early biological phenomena, and instanced Jacob's subtle method of influencing his flocks and herds as recorded in Genesis xxx.

Remarks were made by Dr. Berry Hart, Dr. Nicholson, Dr. Fordyce, and Dr. Ballantyne.

Dr. A. H. F. Barbour and Dr. B. P. Watson read a paper, illustrated by lantern slides, on "Two Rare Pelvic Tumours: Perithelioma of the Uterus, Perithelioma of the Fallopian Tube." The former occurred in a parous woman, aged 58. The symptoms were watery and foetid leucorrhœa and a return of uterine hæmorrhage ten years after the menopause. The tumour, which was removed by hysterectomy, was the size of a five months' pregnancy. On section it was of yellowish colour and contained many hæmorrhages—very like an ordinary sarcoma. Microscopically a great part was necrotic, but throughout the typical structure of a perithelioma could be seen—dilated vessels

with normal endothelial lining surrounded by the tumour cells arranged radially. These cells invaded the muscular wall. The tube case was a woman, aged 51, unmarried and nulliparous. She had a swelling in the lower part of the abdomen and a hæmorrhagic vaginal discharge. When the abdomen was opened there was free fluid and secondary tumour nodules were present all over the peritoneum. The left tube was the seat of a tumour growth and was removed along with the ovary and right appendages. The patient died eleven days after operation. The tube tumour presented the same characters as the uterine one described. It was of a soft brain-like consistence, of a yellowish colour, and contained hæmorrhages. Sections showed the typical structure of a perithelioma. They differed from those obtained from the uterus in that a hyaline faintly staining layer separated the endothelium of the vessels from the surrounding tumour cells. From the appearances it was thought the tumour was primary in the tube, but in the absence of post-mortem examination it was impossible to be absolutely certain.

The President and Dr. Berry Hart made remarks.

RECENT LITERATURE.

CRITICAL SUMMARIES AND ABSTRACTS.

MEDICINE.

By J. S. FOWLER, M.D., F.R.C.P.

HÆMOCHROMATOSIS.

THREE cases of this rare disease are reported by Sprunt (*Arch. Int. Med.*, 15th July 1911). One was simple hæmochromatosis, complicated by tuberculous peritonitis; the two others were quite typical of the more frequently described form known as bronzed diabetes. The disease is rare, there being records of only about fifty cases with, and thirteen without, diabetes. All authentic cases have occurred in males. In *diabète bronzé* we have the clinical picture of severe diabetes, generalised pigmentation of the skin but not of the mucous membranes, and an enlarged, often tender, liver. The discoloration of skin varies from icteric, light sunburn, to earth colour, lead colour, and even bluish black. It is most marked on the exposed parts—nipples, genitals, and axillæ. Pigmentation of the buccal mucous membrane is very rare, in contradistinction to what obtains in Addison's disease. The diabetes is severe and rapidly fatal. Pathologically the non-diabetic cannot be distinguished from diabetic cases, and it is now held that simple hæmo-

chromatosis is merely an earlier or less severe form of the disease. Those who assume that the diabetes is due to changes in the liver or pancreas hold that in simple hæmochromatosis the lesion in these organs has not advanced sufficiently to disturb carbohydrate metabolism; others, who believe that the three cardinal symptoms, pigmentation, cirrhosis of the liver, and diabetes are independent of one another, and due to the same cause, give no explanation of these cases, except that they are less severe forms. In all three of Sprunt's cases the onset was rather abrupt, and the pigmentation became progressively more intense. The chief pathological appearances are—ochre or bronze colour of many glandular organs, the heart muscle, and lymphatic glands; enlargement and cirrhosis of the liver; and changes in the pancreas—atrophy or enlargement. The pigment is hæmosiderin (an iron pigment reacting to ammonium sulphide, etc.) and hæmofuscin (an iron pigment which does not react to ordinary reagents). The former predominates; its characteristic sites are the parenchyma cells, and only after these have disintegrated is it found in the connective tissue. The liver contains enormous quantities of iron in this disease—7 per cent., as compared with 2 per cent. in pernicious anæmia, and .08 per cent. normally—at least ten times as much as that in the whole body of the average human being. Hæmofuscin varies greatly in different cases, being in some scarcely appreciable. It is found characteristically in the connective tissue cells. Increase in the fibrous tissue is found in those organs, notably liver and pancreas, in which great numbers of the cells have degenerated and deposited pigment in the interstitial spaces. A number of the different theories of the pathogenesis of hæmochromatosis which have been from time to time put forward are discussed by Sprunt. At first the diabetes was looked on as primary. Von Recklinghausen, in 1889, described general hæmochromatosis as a change which might occur in the course of different diseases, of which diabetes was one: Buss, in 1894, took up the position that the pigmentation, caused by some primary blood disease, brought about the pancreatic lesion and led to diabetes; Marie regarded it as more nearly allied to the pancreatic than to any other form of diabetes. In 1899 Anschütz supported the view that the primary event was blood destruction from some unknown cause, and Opie took up a similar position. Murri, and most recent German writers, think that the three cardinal features of the disease are independent of one another and due to the same cause, possibly alcohol. Another theory blames defective elimination of iron, not excessive blood destruction, for the pigmentation. This theory assumes various forms. According to Croftan a ferment exists in the liver which can break up hæmoglobin in the presence of sugar. It is then supposed that under some toxic influence the pancreas and liver become cirrhotic; hyperglycæmia results, and in the presence of the excess of sugar hæmoglobin is transformed into hæmochromatin, which

the cirrhotic liver cannot eliminate. A less elaborate theory is that of Melzer, viz. that through some fault in the mechanism of iron metabolism the organs and cells retain all or most of the iron which reaches them on its normal round through the body. Sprunt apparently inclines rather to the faulty elimination than to the blood destruction theory of origin. He certainly makes a strong point when he shows that there is no clinical evidence of abnormal blood destruction or of reparatory activity of the hæmoporetic organs. He lays stress on the fact that in many chemical reactions iron is a potent catalytic agent, and furthers oxidation; he suggests that the normal tissue iron has this function. He is not disposed to accept unreservedly the obvious notion that the diabetes in these cases is due to pancreatic disease, but connects it with the faulty iron metabolism. His position may be summarised thus:—Hæmochromatosis is a disease characterised by a widespread deposit of an iron containing pigment, especially in secretory cells, by the presence in certain situations of an iron-free abnormal pigment, and by an increase of physiological pigmentation. It is a metabolic disease, manifested by a change in the chromogenic groups of the proteid molecule, with the deposit of pigments. This pigmentary degeneration causes fibrosis of various organs. Diabetes may be caused by diminished oxidation due to the faulty iron metabolism, assuming that the iron compounds of the tissues are catalytic agents.

TUBEROUS SCLEROSIS.

The nature of the kidney tumours met with in at least 60 per cent. of cases of this disease is so uncertain that Fischer's paper (*Ziegler's Beiträge*, Bd. I. Hft. 2, 1911), giving the results of eight post-mortem examinations, is welcome. The tumours, he finds, are mixed growths, consisting of non-striped muscle, fat, arteries, and sometimes primitive kidney cells in variable proportions. Such names as lipomyoma, angiolioma, fibrolipomyoma, lipomyosarcoma, etc. (which have been applied to them by various writers), are therefore natural enough. They are not, however, malignant, and metastasis does not occur. They cause, as a rule, no symptoms during life. In some cases the tumours are associated with maldevelopments of the kidneys. Fischer also draws attention to the not infrequent association of kidney tumour with lesions of the brain other than tuberous sclerosis, instancing cases of glioma, psammoma, and psammolioma in which tumours of the kidney, or cysts, were found. Further than that both gliomata and the kidney tumours in question have a developmental origin he has no suggestion to make as to why the two lesions are associated.

MENINGITIS.

"*Meningism*" in *Infectious Diseases*.—In some infectious diseases, notably pneumonia and typhoid fever, meningeal symptoms occur

without definite signs of meningitis (absence of changes in the fluid obtained by lumbar puncture, and normal naked-eye post-mortem findings). To such cases the name "meningism" is applied, and the condition is usually ascribed to toxæmia (Kirchheim & Schröder, *Deuts. Arch. f. klin. Med.*, Bd. ciii. p. 218, 1911). Schulze, however, found microscopic changes in the brain and cord in cases of so-called meningism complicating pneumonia; these changes were of the nature of an encephalo-myelitis. In typhoidal meningism he, and also Sturzberg, failed to detect any definite changes in the brains and cords of patients dying with head symptoms. E. Fränkel investigated the subject from another standpoint—in how far, in infectious diseases, the causal organism localises itself in the brain. In sixty-four of eighty-five brains examined he found organisms, often in great abundance. In many, though not all cases, the organisms were accompanied by pathological changes in the brain, but Fränkel was able to show that analogous changes occurred in typhoid and in diphtheria, apart from the presence of micro-organisms in the brain. The conclusion, therefore, seems justifiable, that in cases of toxæmia involving the brain, whether it be due to toxins produced locally or carried by the blood-stream, the disturbance of function need bear no correspondence to the lesion. Symptoms may occur without anatomical changes, and *vice versa*. Meningism exists apart from meningeal changes, and is caused by a toxæmia of the central nervous system. Kirchheim and Schröder have investigated a series of cases of meningism, *i.e.* cases with well-marked meningeal symptoms, in which the cerebro-spinal fluid showed neither increase of albumen or of cells nor the presence of micro-organisms. The fluid was usually under pressure; sometimes, however, the pressure was within normal bounds. The cases fall into two categories—those with, and those without, microscopical changes in the brain. In the first group fall 2 cases, both scarlet fever; in the second 5, 2 being scarlet fever and 3 pneumonia. Their results thus confirm the conclusion already stated. Moreover, there seem to be no grounds for asserting, as some have done, that meningism constitutes an early stage of meningitis, or passes on into that disease.

Prognostic Meaning of the Blood Picture in Cerebro-Spinal Meningitis.—Rusca (*Deuts. Arch. f. klin. Med.*, Bd. ciii. s. 235, 1911) finds that in cerebro-spinal fever the leucocytes, as a whole, are increased; as the symptoms become worse the neutrophile leucocytes go up, and as the symptoms abate they fall. The behaviour of the lymphocytes is exactly the reverse; with each improvement their relative and absolute numbers rise, with each relapse they fall. Before death eosinophiles and basophiles disappear from the blood. An examination of the blood is, therefore, of some assistance in the prognosis of cerebro-spinal meningitis.

Meningococcus Septicæmia.—*Meningococcus septicæmia* was first

reported in 1899. It usually occurs as a complication of meningitis, but some cases have been recorded in which there was no evidence of pre-existing or accompanying meningeal infection. Cecil and Soper (*Arch. of Int. Med.*, 15th July 1911) give a synopsis of five cases of this kind from the literature and four cases of meningococcus endocarditis. They have themselves observed a case of meningococcal endocarditis with septicæmia which simulated rheumatism and endocarditis, but ran a very severe course, ending fatally on the sixteenth day. A blood culture yielded the meningococcus. Besides showing the usual cultural and staining character, the organism reacted to agglutination and complement fixation tests in such a way as to leave no doubt that it was a genuine meningococcus. There is nothing specially characteristic in either the clinical symptoms or the pathology of this form of endocarditis. In view of the fact that nasopharyngeal infection is the earliest incident in many, if not all, cases of epidemic meningitis, it is of interest to note that the illness was preceded by an attack of tonsillitis. There are, however, difficulties in the way of assuming that infection takes place by direct spread to the base of the brain, and the occurrence of cases such as that reported by Cecil and Soper is rather in favour of a hæmatogenous origin.

SURGERY.

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THE TREATMENT OF CLEFT PALATE.

THE features of the discussion on the treatment of cleft palate at the May meeting of the Royal Society of Medicine were the sharp conflict of opinion on the age at which to operate, and the general acceptance of Langenbeck's operation in preference to those devised by Lane and Brophy. Lane stated that he operated as soon after birth as possible—(1) in severe cases to save life, and (2) to obtain sufficient air-pressure in the naso-pharynx during respiration to enable the naso-pharynx and surrounding bones fully to develop as they do in a normal child. He said that only a fraction of the severe cases survived to come to operation at four to six years. The more serious the case, the earlier in life it should be operated on. In the first few days of life those babies were at their best. Many clefts could only be closed early, as the encroachment of the teeth on the gums deprived the flap of about two-thirds of its breadth. The mortality of 5·9 per cent. with his "turn-over flap" operation was surprisingly small considering the desperate state of many of the children on admission.

The strongest opponents of early operation were Johan Ulrich, of Copenhagen, and James Berry. The former stated that he had found it more difficult to obtain healing at the age of two or under, and in future he would prefer to postpone operation till the age of three years. Berry said he considered early operation the very reverse of life-saving. If emaciated children with a wide cleft were properly nursed by mother or nurse, he did not find that many of them died. The period of choice for the operation in the difficult cases was at two years, but there were many cases with narrow clefts which could be advantageously operated on even in the first year of life. In his series of 144, no death had occurred. Several of the speakers pointed to the absence of statistics showing that the mortality in children with cleft palate not operated on was greater than in ordinary children of the same class.

The chief criticisms directed against Lane's "turn-over flap" operation were:—That the operation is dangerous in young infants (Spencer, Drew); that the soft palate tends to become thin and cicatricial, and the power of articulation poor (Ulrich); that the palate may be too stiff (Ulrich); that there was much scar tissue, the palate was crooked, and when the children spoke there was a drawing up on one side (Kellock); that atrophy of the flap occasionally occurred, sometimes so extensively that further operation was impossible (Berry). Brophy's operation was condemned for its severity by Ulrich and Berry. Ulrich also said that after Lane's and Brophy's operations the teeth were often almost ruined.

The question of prosthesis treatment in wide clefts was discussed by Ulrich. In most of the severe cases operation was followed by poor power of speaking, and in some the palate had required to be again split to apply a prosthesis. On the other hand many adults with a wide cleft spoke very well, almost excellently, with a properly fitting prosthesis. Out of 56 cases he thought that 10 would have done as well without any operation.

Sixty patients were shown at the meeting, and the consensus of opinion was that the results as regards speech were very disappointing. G. E. Waugh dwelt particularly on this aspect. He said that only one of the patients shown did not betray by his speech that he had been the victim of cleft palate. It did not matter whether the operation was done in infancy or slightly later, or whether the original defect was slight or grave. Even if the structure and mobility of the palate were perfect, the child might speak as if it had no roof to its mouth and no mobile palate. In all probability there were two lesions to consider—one in the function of the speech centres, and one in the structure of the palate—and they were associated but not interdependent. Surgeons could claim no more than that operation would allow of breathing through the normal passages, and of swallowing in a fairly normal manner.

THE TECHNIC OF APPENDICOSTOMY.

Yeomans draws attention to the danger of sloughing of the appendix after the operation of appendicostomy, and states that it is due to interference with its blood supply (*Western Med. News*, May 1911). The sole supply comes from two branches of the posterior ileo-cæcal artery, appendicular and cæcal, the latter of which courses over the inner and back wall of the cæcum. This artery gives off a constant branch which runs along the mesenteric side of the appendix and anastomoses with branches of the appendicular artery. Occasionally a smaller twig runs along on the aspect opposite the mesenteric attachment. The appendicular artery divides into several mesenteric branches, three to five in number, of which the largest runs in the free border of the meso-appendix. The cæcal branch is the only one existing in the embryo prior to the sixth month, and it remains the only one in adults in whom the appendix is rudimentary or retains its fetal characters. Hence it comes to be of importance not to prick it in performing appendicostomy. The anastomoses between the two arteries of supply to the appendix are slight, and the appendicular artery is almost terminal; hence its obliteration by a suture is likely to involve necrosis of the appendix beyond its mesentery. Both vessels should be preserved. When the mesentery is short and the appendix falci-form, to render the lumen straight for the irrigating tube it is necessary to free the mesentery, and this should not be done by ligating and dividing it, a procedure which is apt to cause gangrene of the tip. The two layers of the mesentery should be separated at the junction with the posterior mural peritoneum, beginning at the free border and carefully displacing the cellular tissue with the contained appendicular artery and branches as far as necessary towards the appendix. The two layers of peritoneum are divided transversely up to the base of the appendix, turned in, and sewed to obliterate the raw surface on the posterior abdominal wall. The cæcum adjacent to the appendix should be sutured to the parietal peritoneum.

THE PYLORIC VEIN.

Of the comparative frequency of gastric and duodenal ulcers widely varying statistics are given. According to W. J. Mayo the ulcer is duodenal in 60 per cent. of cases, and his opinion is upheld by Mayo Robson, Moynihan, and many others. French surgeons, on the other hand, maintain that gastric ulcer is about six times as common as duodenal. It is clear that as the "surgical" ulcers are in the great majority of instances situated in the pyloric region, the statistical differences depend on the interpretation of what is stomach and what is duodenum. Many British and American surgeons take as the

dividing line on the peritoneal aspect the pyloric or pre-pyloric vein. Moynihan describes it as a delicate vessel, arising on the lesser curvature and descending on the anterior aspect of the pyloric region to the greater curvature, where it joins the right gastro-epiploic vein. The description given by W. J. Mayo and by Souligoux is essentially the same: From the lower side a thick vein passes upwards on the anterior surface, and from the upper border a second vein reaches downwards in the same line, nearly, if not quite, meeting the first. Vigne found this description accurate in twelve out of fifteen cases, the vein corresponding exactly to the pyloric valve (*C. R. Soc. Anat.*, 6th January 1911). Ricard states that the vein is inconstant, and in several of the text-books it is not even figured. Charpy states that it runs upwards and joins the coronary vein, while Testut says it enters the portal vein. Debierre places it well to the left of the pyloric valve, and Deschamps, in his monograph on the celiac axis, figures various relationships that it may possess. The latest investigations are those of Tramblin and Fontau (*L'Echo méd. du Nord*, 9th July 1911). They examined the pyloric region in twenty-one cadavera, ten unprepared and eleven injected through the portal vein. They state that they found only once a vein running as Moynihan described it, and it did not correspond exactly to the pylorus. In the others there was no single pyloric vein. The most frequent type, found in seventeen instances, consisted of two or three venules arising within two centimetres of the upper border of the pylorus and running up vertically or obliquely to the left towards the lesser curvature, where they formed the origin of the coronary vein, a tributary of the splenic vein. A similar arrangement was found at the lower border, three to six venules descending to join the pancreaticoduodenal vein. They conclude that a vertical pyloric vein which can be depended on to mark externally the division between the stomach and duodenum does not exist.

TREATMENT OF MAMMARY ABSCESS.

Dissatisfied with the time occupied each day by the suction treatment, and with the total duration of the treatment, I. Seff recommends the following technique in acute abscesses of the mamma and other parts of the body (*Amer. Journ. of Surg.*, July 1911):—On the first appearance of localised tenderness, pain, and induration apply wet compresses for twenty-four to forty-eight hours. As soon as a definite area of softness appears a small puncture is made with a scalpel, and the pus is allowed to escape. The cavity is then washed repeatedly with corrosive sublimate lotion (1 in 5000), and filled by means of a small hand syringe with tincture of iodine. For a few minutes there is usually a moderate degree of pain of a burning character. Within a very short time an area of redness develops for a considerable distance

beyond the confines of the abscess, and persists throughout the period of healing. The bichloride solution and the tincture of iodine are used at subsequent dressings as long as the discharge is purulent. When it becomes serous iodine alone is injected, and a firm dressing is applied. Twenty-four hours after the first application a zone of induration is developed, and this remains during the period of healing. In the majority of cases healing takes place in ten to fourteen days. The author states that possibly saline solution is as efficacious for washing out the cavity as corrosive sublimate. One of the advantages claimed for this method is that nursing is interrupted only for six days.

OSTEOPLASTIC OPERATION FOR SPINA BIFIDA.

Babcock describes an operation which he has carried out in four cases of well-marked spina bifida (*Monthly Cyclop. and Med. Bull.*, May 1911). The child is placed head downward on a sloping sheet firmly slung to the leg rests of an ordinary operating-table. Any abraded area is painted with carbolic acid and alcohol, and the whole area is treated with tincture of iodine. Three centigrammes of novocain, dissolved in half a cubic centimetre of 10 per cent. alcohol, are slowly injected through a fine needle into the upper part of the sac. If the sac is not too thin all abraded and ulcerated surfaces are cut away. The nerve filaments and portions of spinal cord are identified by transillumination. The skin at its junction with the sac is freed and turned back, the sac is punctured, and, if a sufficiently large area between adherent nerves is found, resected; otherwise it is allowed to collapse into the spinal cavity, folded into proper size, and sutured by fine catgut. The edge of the dura, where it blends with the inner surface of the lamina, is incised on either side and stripped from the bony canal for the entire distance of the defect. It is then sutured to restore the dural canal. The margins of the bony canal are freely exposed, and the laminae on each side are divided with bone forceps along the whole length of the gap. These bridges of imperfect spines and laminae and fibrous tissue, which are still attached above and below, are united by chromicised catgut in the middle line. A knife is then passed through the erector spinae group of muscles, splitting off on either side a broad strip of muscle with its overlying aponeurosis. These bridges are in turn slid in and fixed in the middle line. As the skin is usually thin and poorly nourished it is advisable to evert the edges and bring broader surfaces in contact by means of mattress sutures. If hæmorrhage is prevented the operation causes little shock. Of the four cases in which the operation was employed one child has learned to walk, and is bright and active, and a second with double club foot is robust and mentally bright; the other two children died of secondary hydrocephalus.

OBSTETRICS AND GYNÆCOLOGY.

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THE TREATMENT OF PLACENTA PRÆVIA.

THE numerous papers that have recently appeared and the discussions that have taken place on the treatment of placenta prævia are a sufficient indication not only of the importance of the subject but of the fact that doubt still exists in the minds of obstetricians as to the best treatment of this complication.

Twice within two years the management of placenta prævia was the subject of a symposium at the annual meeting of the American Gynecological Society, and in April of last year Jellett, in a paper which is a model of clear statement and lucid argument, initiated a discussion before the Obstetrical and Gynecological Section of the Royal Society of Medicine on "The Place of Cesarean Section in the Treatment of Placenta Prævia."

The papers read at both societies and the discussions which followed served to show that even among the foremost obstetricians differences of opinion and of practice obtain; but the differences are differences rather of detail than of principle, and are probably more apparent than real, the conditions indicating one or other modification not always being definitely stated.

On many points in the treatment of placenta prævia there is general agreement. All are agreed on the importance of early diagnosis, and on the necessity, immediately the condition is recognised, of proceeding to empty the uterus without delay. This may be done in several ways, and it is of less importance, as a rule, which of the recognised methods is employed than that the method selected be proceeded with at once. There is much of truth in the conclusion to which Newell's experience in hospital and private practice led him, that the extremely high mortality found in general practice depends not so much on the method of delivery adopted or the lack of operative skill on the part of the attendant—though to a certain extent that is a factor—as on the time wasted before active measures are undertaken. In the treatment of placenta prævia there must be no temporising. It must be clearly enforced by all teachers that a woman with placenta prævia is never safe until the uterus is emptied. The problem to be met when this complication is recognised is "how to empty the uterus in the safest way." Unfortunately in placenta prævia the safest way for the mother is the most dangerous for the child. The foetal mortality "apparently increases as the maternal mortality lessens" (Jellett). Attempts to save the child will be made at the expense of

the mother, but "in placenta prævia the child must take its chance, the mother must be the first consideration" (Champneys).

What is the best method of emptying the uterus in the interests of the mother? That is the problem to be solved in placenta prævia, and, as Fry observes, it is purely an obstetric one, and its decision should rest with obstetricians. "Men who have handled these cases according to modern obstetric methods, who are familiar with the dangers incurred, who have learned to overcome the difficulties and dangers, they, and they only, should decide what method of procedure is best for each individual case."

In proceeding to empty the uterus the exact procedure to be adopted will differ with the conditions present. It should be clearly recognised that no single method is applicable to all cases. The particular method must be determined by the existing conditions, more especially the extent and continuance of the hæmorrhage, the effect of this hæmorrhage on the general condition of the woman, and the state of the cervix uteri as to dilatation and dilatability.

First as regards hæmorrhage. If serious bleeding continues it must be arrested. In placenta prævia hæmorrhage can always be readily controlled by tamponing the cervix and vagina with gauze. Where dilatation has not begun and the cervix is maintained almost in its entire length the gauze plug is the best, if not the only, means of checking hæmorrhage. A few obstetricians would seem to be opposed to its use on account of the danger of infection which it carries with it, but with an undilated and rigid cervix we know of no satisfactory substitute, and if proper precautions are taken the risk is very little. The plug not only controls the bleeding but produces softening and dilatation of the cervix. On removal of the plug it will usually be found possible to complete the necessary dilatation digitally. Where this is impossible the plugging must be repeated. To be of any use plugging must be done efficiently, and it must be done with the strictest aseptic precautions. The writer has seen serious results from sending women to hospital, relying on a vaginal plug that was absolutely useless for the purpose of restraining hæmorrhage.

While plugging the cervix and vagina is an efficient and, on the whole, safe means of arresting hæmorrhage in placenta prævia, the method, unless very carefully carried out, does involve a certain degree of risk, and therefore it should not be resorted to unnecessarily. Where dilatation can be effected digitally or De Ribes's bag used, one or other of these should be preferred. Fortunately in the great majority of cases the gauze plug is not required. The combination of dangerous hæmorrhage with a cervix not drawn up and rigid is rare in placenta prævia. Much more commonly dilatation has begun, and the os is found to be sufficiently opened up to admit one finger or more. When the os just, or barely, admits a finger, the method of arresting the

bleeding will depend on its dilatability. If rigid and not dilatable the tampon must be resorted to, but if dilatation can be secured this should be effected manually to the extent to admit De Ribes's bag, or to permit of bipolar version. Either the bag or the breech will effectively control hæmorrhage.

In most cases of marginal placenta prævia and in some cases of the lateral variety bleeding will often be at once checked, if labour has begun, by simply rupturing the membranes; but this should not be done until the exact conditions have been determined. Should bleeding continue after rupture of the membranes an attempt may be made to check it by forcing the presenting part down on the lower uterine segment. As the fœtus is usually premature and small this can in most cases be readily accomplished. If this fails to check the hæmorrhage De Ribes's bag or version must be employed according to the extent of dilatation.

By one or other of these means hæmorrhage in placenta prævia can always be controlled; but arrest of the hæmorrhage is not the treatment of placenta prævia—it is merely a temporary expedient. At the same time the methods employed to check the bleeding have the effect of, or directly aim at, promoting dilatation of the cervix, thus facilitating the real object of treatment—the emptying of the uterus.

The first step in the process of emptying the uterus is dilatation of the cervix uteri, and to obtain sufficient dilatation is the chief difficulty in effecting delivery in placenta prævia. In many cases this difficulty has already been overcome before the patient comes under observation. When the case is first seen dilatation may be advanced sufficiently to allow of bipolar version, which should be at once performed—if preferred, De Ribes's bag may be inserted—or dilatation may be sufficient to permit of immediate delivery with the forceps. Where possible instrumental delivery should be selected in preference to version, which involves a greater risk to the child. Even where dilatation has not begun, or has only just commenced, it is usually easy in multiparous women to secure the necessary dilatation digitally. The softened condition of the cervix which, as the result of hæmorrhage, usually obtains in placenta prævia renders manual dilatation an easy and safe operation. It should, however, be effected slowly and gradually; rapid dilatation should be avoided, as it not only provokes hæmorrhage but tends to laceration of the cervix. Dilatation should be carried no further than is necessary for the performance of bipolar version or the introduction of De Ribes's bag. Dilatation to this extent is comparatively safe, “while that necessary for the insertion of the hand and podalic version is dangerous” (Fry).

As to the relative advantage of bipolar version and the elastic bag in the treatment of placenta prævia obstetric opinion is meantime

divided. Both satisfactorily control the bleeding: but the bag has this advantage, that it can be employed with less preliminary dilatation than is necessary for version. Further, the use of the bag very materially improves the chances of the child, but at a slightly increased risk to the mother. On the latter ground some obstetricians are opposed to its use. According to Jellett, De Ribes's bag has seldom, if ever, been used in the Rotunda Hospital, while Edgar states that hydrostatic bags have not been popular in his hospital service. The writer frequently uses the bag in placenta prævia, and is of opinion that there are cases in which it is better to use this method than to attempt to secure the extra dilatation necessary for bipolar version.

It still remains to consider how dilatation is to be obtained in these cases, fortunately very rare, in which the cervix, maintained almost in its entire length, is rigid and undilatable. It is in these cases, and these cases alone, that Cæsarean section finds any valid indication. It is impossible in these circumstances at once to obtain dilatation sufficient for version or the employment of the bag; but it does not follow, as Jellett points out, that because the treatment of Braxton Hicks is immediately inapplicable the next best treatment is Cæsarean section. Even in these conditions dilatation can be secured. The cervix may still be dilated or incised to an extent to admit two fingers into the uterus, but Jellett thinks both these methods too dangerous, and prefers plugging the vagina, which he regards as a safe and reasonable means of gaining time in which cervical dilatation can occur. Among the 138 cases of placenta prævia collected by Jellett from the Rotunda Hospital statistics there were four in which it was found impossible to carry out the treatment of Braxton Hicks when the patient was first seen, and in each of these the vagina was plugged, and when dilatation was obtained bipolar version was performed. All the patients recovered satisfactorily, and Jellett observes that "for them at any rate, there was no need for Cæsarean section." Jellett seems to advise plugging the vagina only; it is better to plug the cervix as well, as dilatation is thereby better promoted.

There are thus few, if any, cases of placenta prævia in which dilatation cannot be safely secured, but dilatation is merely a preliminary step in the emptying of the uterus. In subsequently effecting delivery the exact procedure will depend on whether version or the bag has been the method selected. When the latter, delivery is usually best completed by the forceps immediately after expulsion of the bag. In some cases, where the head at once descends and the hæmorrhage is checked, delivery may be left to nature. Where version is performed immediate extraction of the child should not be attempted; hæmorrhage is under complete control, and delivery should be left to the contractions of the uterus. Rapid extraction

will seldom save the child, at any rate if much blood has been lost, while it will almost certainly lead to laceration of the cervix and serious post-partum hæmorrhage. When the child is viable and the mother in good condition Newell thinks that an effort to save the child by rapid extraction is justifiable, even though the danger to the mother may be slightly increased. Before extraction is undertaken, however, he pushes dilatation (manual) to the highest possible point. In the more pronounced forms of placenta prævia it is seldom possible to carry dilatation to this extent without encountering serious bleeding; where it can be secured instrumental delivery will suggest itself as preferable to version.

In the management of cases of placenta prævia it should be borne in mind that the danger does not end with the extraction of the child. There is always the risk of post-partum hæmorrhage and sepsis. The latter must be guarded against by the most careful asepsis during and after labour. The frequency of post-partum hæmorrhage in placenta prævia is, we think, exaggerated; bleeding to any great extent is, in our experience, exceptional. Still, where much blood has been lost before or during labour, moderate bleeding post-partum may be serious or even fatal, and consequently the importance of limiting the amount of post-partum bleeding must be kept in mind. When hæmorrhage occurs before the placenta is expelled it should be removed without delay, manually if necessary. If hæmorrhage continues, even though not profuse, the uterus and lower segment should be plugged with sterile gauze. Properly applied the intra-uterine tampon "is a most valuable agent in safeguarding the patient from the disastrous consequences of further loss of blood. No substitute can be employed safely to control post-partum bleeding in these cases" (Fry). It should be inserted immediately on the removal of the placenta where the woman has already lost a large quantity of blood, but its routine employment in all cases of placenta prævia, though strongly recommended by Edgar and others, is not called for. In placenta prævia it is important that all the materials necessary for the treatment of shock and excessive loss of blood should be in readiness before the completion of delivery.

The indications for Cæsarean section have not been referred to. They have been dealt with in a previous summary by another writer. On this question Jellett's interesting paper will well repay perusal.

OPHTHALMOLOGY.

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INTERSTITIAL KERATITIS.

THIS very troublesome affection is met with usually between the ages of eight and fifteen, although it may occur earlier, even before birth (Parinaud), or as late as the thirty-sixth year (Huguenin). True interstitial or parenchymatous keratitis is now believed to be due almost entirely to inherited syphilis. The corneæ, or windows of the eyes, lose their crystalline transparency, and present a ground glass or red appearance, suggestive of stained glass windows commemorative of parental delinquencies. Be that as it may, it is undoubtedly the most frequent ocular lesion in inherited syphilis, bearing a proportion of about 60 per cent. to all other manifestations (Stieren, *The Ophthalmic Record*, July 1911).

Histologically the affection is characterised by an infiltration of round cells into the deeper layers and lymph spaces of the cornea, followed by an invasion of minute ciliary blood-vessels. It begins insidiously, without much pain, and with but little inflammatory reaction, as a diffuse haziness in the centre of the cornea, which spreads outwards to the periphery ; or it begins at the periphery and spreads inwards to the centre. Under corneal magnification the infiltration does not appear uniformly diffuse, but presents the appearance of foci throughout the entire thickness of the corneal tissue. The cornea soon becomes stippled and lustreless, as if breathed on, owing to minute foci of epithelial desquamation, but curiously enough it never ulcerates. [In passing it may be noted that the writer has never, to his knowledge, seen a phlyctenular affection either of the cornea or of the conjunctiva concurrently with interstitial keratitis—a point of some etiological significance in view of the theory that phlyctenular affections are tuberculous.] The affection is always bilateral, although not necessarily simultaneously ; but in cases over thirty years of age delayed interstitial keratitis is occasionally met with, which is generally unilateral and very severe. In acquired syphilis, on the other hand, true interstitial keratitis is extremely rare, and when it is found it is usually unilateral (Parsons).

Pericorneal injection, which always accompanies the disease, indicates deep-seated inflammation, and should be regarded as a danger signal necessitating a careful vigilance as to the condition of the iris. Indeed it is well to regard all cases of interstitial keratitis as an anterior uveitis, *i.e.* inflammation not only of the cornea but also of the iris, ciliary body,

and anterior part of the choroid. In true interstitial keratitis it is correct to say that iritis is always present. The disease is a kerato-iritis. This gives the keynote as to treatment, for the pupil must be kept dilated from the very outset to anticipate or break down posterior synechiæ as in the treatment of ordinary iritis.

Disturbance in vision is usually an early symptom, and is due chiefly to alteration in the transparency of the cornea, and to some extent to exudations into the aqueous humour and pupillary area from the inflamed iris. Vision may be reduced to recognising hand movements only, while on the other hand very mild cases are met with, although seldom, in which the patches of cloudiness are thin, sparsely vascularised, and clear up comparatively quickly. In the marginal type, which is also seldom met with, the opacity may be limited to a sector only (Parsons).

Intense photophobia and reflex blepharospasm may be present, which cannot be relieved by the application of cocain, as is generally the case in the photophobia and blepharospasm met with in phlyctenular affections of the cornea. As regards treatment during a severe attack of blepharospasm, apparently all that can be done locally is to keep the pupil dilated with atropin to prevent adhesions of the iris to the anterior capsule of the lens (posterior synechiæ). All irritants, such as yellow oxide of mercury ointment and astringent lotions suitable for phlyctenular ulcers or conjunctivitis respectively, must be carefully avoided during the early stage of the disease, hence the importance of accurate diagnosis.

Vascularisation.—At the end of a few weeks, when the infiltration seems to be at its height, newly-formed blood-vessels push their way inwards from the deeply situated ciliary vessels around the cornea. These vessels run in radial bundles like a broom or besom, thus differing entirely from the coarse arborescent-looking vessels derived from the conjunctiva in phlyctenular corneal affections and trachomatous pannus. The ciliary vessels thus found in interstitial keratitis can readily be recognised by the fact that when traced backwards they are lost sight of at the *limbus corneæ*, being situated in the dense white sclerotic, whereas the superficial or conjunctival vessels can be traced backwards to their origin in the conjunctiva over the limbus. When the vascularisation is complete the cornea may assume a cherry red appearance resembling a hæmorrhage into the corneal stroma. Examination by means of a strong magnifying glass will, however, dispel this resemblance and demonstrate the existence of a closely-set net-work of capillary blood-vessels. The presence of vascularisation is regarded usually as a good omen, in the belief that the greater the vascularisation the greater the power of absorption. That may be true, but, as frequently happens, this deeply situated vascularisation of the cornea, which sets out, so to speak, with good intentions, may overstep physio-

logical limits and become pathological. A certain amount of vascularisation may be necessary for repair, for it would seem that the nutrition of the cornea by lymph is sufficient only under physiological limitations, but not sufficient to produce repair during the severe pathological conditions obtaining in acute parenchymatous kerato-iritis.

Resolution.—When the stage of infiltration has reached its height the inflammatory process seems to remain more or less stationary for a few months, and then commences to subside. The minute ciliary blood-vessels in the cornea gradually become obliterated, and the opacity little by little begins to resolve. This process of clearing up begins at the periphery and travels very slowly inwards towards the centre, restoration of vision being thus necessarily protracted. In simple uncomplicated cases complete recovery may be looked for, but as a rule some permanent defect in vision remains, due to a more or less dense and persistent opacity in the centre of the cornea, or to the sequelæ of deep-seated mischief in the iris, ciliary body, or choroid; *e.g.* the ciliary body—the headquarters of the commissariat department of the eyeball—may be permanently damaged by long-standing inflammation and exudations, thus leading to partial loss of vision, or even softening of the eyeball in very severe cases. Such untoward complications seem unavoidable, and resist the most energetic forms of treatment. Atropin, for instance, in these severe cases has little or no effect in dilating the pupil.

The prognosis, then, must always be guarded, especially during the stage of infiltration, for it is impossible to predict what the ultimate result may be. At the same time the patient, who in many cases is practically blind, must be encouraged by every means possible to take an optimistic view of his case.

In a very few instances, owing to extensive and prolonged vascularisation, the cornea may become so softened as to bulge forward under ordinary intraocular tension (*Keratectasia*), when the condition looks hopeless. Enucleation, which seems not only inevitable but desirable, is, however, contraindicated, for in time these cases make a wonderful recovery, at least from a cosmetic point of view.

Hypopyon, or so-called pus in the lower part of the anterior chamber, is extremely rare in interstitial kerato-iritis. The writer recollects of one very severe case, however, where the hypopyon was 3 mm. deep. It occurred in a male, æt. 36 years, with manifest inherited specific physiognomy. The disease was confined to the left eye, which after several months made a presentable recovery, although the vision was practically destroyed.

TREATMENT—(1) LOCAL.—A. *Acute Stage*—(Infiltration and Vascularisation).—As has already been stated, the disease is not a keratitis *per se*, but an anterior uveitis. Yet the affection of the cornea, apparently the most prominent symptom, masks the serious nature of the

condition. It is therefore of the utmost importance that all therapeutic efforts be directed against the real danger, namely, the deleterious effects of the irido-cyclitis, for the purely corneal condition is of secondary importance at this stage. To combat the iritis atropin is our sheet-anchor. It must not only be regularly and properly applied, but continued till all inflammatory symptoms have completely subsided. The only danger in the prolonged use of atropin that may be met with in young patients is *atropin poisoning* or *atropin irritation*. Both can be prevented by using the alkaloid of atropin in the form of ointment, when it is less liable to pass down the tear-duct and be swallowed and cause poisoning. Atropin used from the outset in the form of ointment, and especially in young people, does not cause irritation of the conjunctiva (*atropin irritation*), provided the patient has not suffered from atropin irritation on a former occasion. Further, the mydriatic effect of atropin is increased when used in the form of ointment as compared with atropin drops. The ointment is used in the same strength as the drops (4 grs. to the ounce of lanoline). The size of a split pea at a time is inserted on a glass rod between the lower lid and the eyeball after the lower eyelid is pulled well down. The glass rod with the ointment is pressed gently into the lower conjunctival cul-de-sac, and the patient's eyelids are then tightly closed over the rod, which is removed with slight rotation. This method of application is painless, and after a practical demonstration and a very little practice it can be carried out by the patient's friends efficiently. The mydriatic and beneficial effect of the atropin ointment, which allows more light to enter the eye than usual, is neutralised by the wearing of London-smoke glasses, or by the use of a large double shade covering the face from ear to ear and down over the nose. If at all possible the patient should be encouraged to spend as much time as he can out of doors. A darkened room should be avoided, owing to its injurious and depressing effect. When photophobia is prominent several remedies for its relief may be tried, such as hot fomentations, counter irritation of sorts, the use of cocain, leeching, etc., but so far the writer has found all such ineffectual, time and the persistent use of atropin being the only real help available.

B. *Regressive Stage*.—To aid in the removal of the round cell infiltration *dry heat*, by means of the electric lamp, or *hot moist fomentations*, is useful, probably by stimulating the amoeboid movements of the fixed corneal cells and thereby increasing the circulation of lymph through the stagnant lymph spaces of the cornea. *Dionin* (5 per cent. solution) is also beneficial at this stage, and when employed the patient or friends must be warned that the chemosis following the first few instillations is beneficial in proportion to the severity of the reaction. *Intramuscular injections of fibrolysin* are useful only in the late regressive stage, when the process of clearing up becomes arrested. It may do

harm during the acute stage, but we have never seen any bad effects from its use after vascularisation has cleared away. In some of our cases a marked improvement in the transparency of the cornea has been observed after twenty injections or so into the arm, but in others no appreciable difference could be observed. Indeed, so far as our own experience of the beneficial use of fibrolysin is concerned, it is at present a moot point whether the undoubted clearing-up process observed after the injections in some of our cases is permanent or not. The usual treatment of *massage with yellow oxide of mercury* ointment (4 to 8 grs. to the ounce) is helpful, but like other irritants yellow oxide must never be employed during the acute stage. *Optical iridectomy* downwards and inwards, followed by tattooing, may be tried should the central part of the cornea remain permanently opaque, and thereby cause marked impairment in vision. It is surprising how little benefit one finds after the iridectomy unless the central opaque part of the cornea be tattooed.

(2) GENERAL TREATMENT.—As interstitial keratitis is invariably met with in cases of inherited syphilis it is customary to adopt anti-syphilitic remedies, but experience shows that it is very doubtful if they have any real influence over the course of the disease. We have in the past given, as routine, mercury and iodide of potassium only in cases showing a marked specific physiognomy, as evidenced by the teeth, the saddle-shaped condition of the nose, scars at the angles of the mouth, etc. Should the specific physiognomy be absent or not prominent general tonic treatment, such as syrup of the iodide of iron, cod-liver oil, and general tonics, combined with hygienic régime, is preferable.

DISEASES OF THE EAR.

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DEAFNESS IN CHILDREN.

THE degree of deafness may vary from a very slight impairment of hearing up to complete loss of this sense. The deafness may be either congenital or acquired, and the acquired form may come on before or after the child has learned to speak. If the loss of hearing be absolute and occur before the child has learned to talk, the condition known as deaf-mutism necessarily results.

We may divide cases of deafness into—I. The Slighter Forms of Deafness, and II. Deaf-mutism.

I. SLIGHTER FORMS OF DEAFNESS.

A rational classification of deaf children should include all cases, slight or severe. For this purpose medical examination of all children during the first year of school life is a necessity. This we have already obtained. The next step, according to Yearsley, is the further investigation of all cases of deafness by an otologist who examines the ears, and is then able to classify them into—(1) the slightly deaf, (2) the semi-deaf, and (3) the very deaf. There is, however, no sharp dividing line between cases of slight deafness and those of severe (or absolute) deafness which lead to deaf-mutism. As Kerr Love says, each case must be studied individually; we must “forget the system and study the deaf child.”

Among children in the ordinary hearing schools there are from 10 to 33 per cent. who are more or less deaf in one or both ears; many of these children are unable to gain the full benefit of the teaching given. These are, as a rule, cases of Eustachian obstruction associated with the presence of adenoid post-nasal growths and nasal and pharyngeal catarrh, but there are also numerous cases of catarrhal and purulent otitis media. Yearsley points out that 50 per cent. of these children can be entirely cured by suitable means, and adds that medical inspection is futile unless it is followed by efficient treatment. Cases of slight deafness should be tested as follows:—The child is turned sideways to the examiner and the ear not under examination is occluded by an assistant with a moistened finger; the child's eyes must also be closed so that there may be no lip-reading. Yearsley recommends that the forced whisper be used, and states that, unless the child can repeat simple words of two syllables and numbers so pronounced at a distance of four feet, it is unlikely to gain much benefit from the ordinary hearing school education, because the child must be able to hear what the teacher says when it is looking at its book and also when the teacher's back is turned as he writes on the black-board.

Treatment.—Cases of simple Eustachian obstruction due to “adenoids” and nasal catarrh usually recover spontaneously after the cause has been removed. Suitable breathing exercises are of great benefit in many cases, while in some a course of inflation of the middle ear by Politzer's method may be necessary to complete the cure. Cases of chronic purulent otitis media, on the other hand, are not so easy to deal with; at present they are, as a rule, left to the tender mercy of the mother, who may have six other children to attend to. It is absurd to expect such a woman to buy an ear syringe, boracic acid or lysol, and peroxide of hydrogen, and to syringe the child's ears efficiently and with antiseptic precautions thrice daily; she has not the time, skill, or patience, and very often not even the money to carry out her instructions. For these cases school clinics should be instituted

where treatment could be carried out by trained women under the supervision of an aural surgeon who would soon be able to form an opinion as to the possibility of a cure being obtained by conservative methods. The question of operation could then be considered.

Education in Cases of Slight Deafness.—(1) *Slight Cases.*—These children should be made to sit in the front row and should have special attention paid to them by the teacher; as they are not shining lights they are too often relegated to the back benches.

(2) *The Semi-Deaf.*—These children should get instruction in lip-reading as well as the ordinary oral-teaching; special lip-reading classes should be held on certain days of the week in the ordinary hearing schools, and should be under a certified teacher of the deaf.

(3) *The Very Deaf* (who cannot hear a forced whisper and can only hear the ordinary voice at four feet or less). In these cases the mental capacity of the child is of great importance. If the pupil be bright and have fair hearing and natural speech, he should be educated in a special class conducted in the ordinary school by a teacher of the deaf. If, on the other hand, the pupil be dull, the deafness more marked, and the speech imperfect, he should be sent to the oral class of a deaf school (Yearsley).

II. DEAF-MUTISM.

Scripture defines deaf-mutism as “total or partial deafness followed by failure to learn to speak or by loss of speech already learned.” It must be clearly understood that mutism, or dumbness, in the vast majority of cases is merely the result of deafness; the child does not speak because it never hears speech. Even a normal child would not talk if brought up by dumb people on a desert island. Cases do, however, occasionally occur in which the child has normal hearing but cannot speak; as a rule these are of feeble intellect. If the child is born deaf, or becomes deaf before it has learned to speak, it will of course be dumb. Even if the child only becomes deaf at the age of 4 years it will lose its speech in about five months unless special training be commenced at once. If deafness occurs at the age of 7 years the child loses its speech in about one year, and when speech has been entirely lost it is very difficult to begin again. It is therefore unnecessary to emphasise the importance of taking such cases in hand as soon as possible after the occurrence of deafness. Parents are often unwilling to believe that a child is congenitally deaf, and, even up to the age of 5 years, may attribute the absence of speech to backward mental development.

Statistics.—The number of deaf-mutes varies in different countries: thus in Holland there are 3·4 and in Scotland 5·7 deaf-mutes per 10,000, whereas in Switzerland the number is 24·5; this high figure is accounted for by endemic cretinism and too close intermarriage.

Mygind also points out that in poor districts there is a high rate of deaf-mutism. Bezold states that the deafness is acquired in more than half the cases, and that it comes on most frequently during the first or second year of life. Kerr Love states that 50 per cent. of deaf-mutes are absolutely deaf, 25 per cent. can hear a loud sound close to the ear, while 25 per cent. can hear speech to some extent. Bezold is of opinion that 30 per cent. of deaf-mutes have sufficient hearing to enable them to pick up vowels and even words.

Causes of Congenital Deaf-Mutism.—1. *Consanguineous Marriages?*—This question is very difficult to settle, because we do not know accurately the proportion of consanguineous marriages to the total number of marriages. Professor Karl Pearson thinks that the number of first cousin marriages is about 4·7 among normal people, and Miss Elderton states that it is about 8 per cent. among the parents of deaf-mutes.

2. *Heredity.*—E. A. Fry states that when the parents are related before marriage, one or both being deaf, 30 per cent. of their offspring are deaf-mutes. Miss Elderton thinks that a deaf-mute or albino, or anyone coming from a stock tainted with these diseases, should not be allowed to marry a cousin, because such marriages tend to accentuate any family trait in the offspring, even though such a trait may be dormant in the parents.

Pathology of Congenital Deaf-Mutism.—Our knowledge of this subject has been greatly advanced during recent years by improvements in the technique of microscopical examination of the inner ear in which the lesion is situated in practically all cases. Siebenmann has divided cases of congenital deaf-mutism into two groups: (1) those in which the bony and membranous labyrinths are absent—due to non-formation of the otic vesicle; (2) those in which the bony and membranous labyrinths exist, but in which the sensory epithelium and nerve ganglia are degenerated over more or less extensive areas—the cochlea may be alone affected or all structures of the membranous labyrinth may be involved; the vascular supply of the inner ear is sometimes deficient. Some of these cases appear to be due to antenatal meningitis, others are associated with retinitis pigmentosa. In one case Alexander found changes in the bony capsule of the labyrinth similar to those present in otosclerosis. The same writer has described a case of cretinic deafness in which the acoustic nerve and its ganglion along with the organ of Corti were degenerated; the mucosa of the middle ear showed myxomatous thickening. Thyroid extract may possibly be of use in such cases. Hereditary degenerative deaf-mutism is often associated with albinism and deficient mental and bodily development. Such cases are usually ataxic, and altogether the condition strongly resembles that found in pure-bred Japanese waltzing mice (Hammer-schlag.)

Causes of Acquired Deaf-Mutism.—Bezold gives the following statistics from the examination of 233 cases :—Cerebro-spinal meningitis accounts for 32 per cent. ; other inflammatory diseases of the brain and its membranes, 28 per cent. ; scarlet fever, 18 ; suppurative otitis media, 6·4 ; congenital syphilis, 5·6 ; injury, 3 ; measles, 2 ; diphtheria, 1·7 ; typhoid, 1·3 ; lung disease, 1 ; mumps, 7 ; whooping-cough and osteomyelitis, 4.

Pathology.—These cases may be divided into five groups : (1) Cases of meningitic origin in which the infection passes to the labyrinth along the subarachnoid lymph space surrounding the auditory nerve or along the vestibular or cochlear aqueducts. The hollow spaces of the inner ear are often found to be filled with connective tissue in which new bone is deposited. (2) Cases of tympanic origin following scarlatina, measles, etc. Here the structures of the middle ear are extensively diseased, and the infection passes to the labyrinth through the oval or round windows or by way of the external semi-circular canal or promontory. The membranous labyrinth is destroyed by the suppurative inflammation, and the cavities of the bony labyrinth are subsequently filled by connective tissue and bone. (3) Nager has recorded a case of deaf-mutism following injury ; the inner ear was partially filled by new bone and the sensory epithelium and ganglion cells were destroyed. (4) Congenital syphilis. A thorough microscopical examination of a case of congenital syphilitic disease of the inner ear is still lacking, but Meyer has investigated the auditory apparatus from congenital syphilitic children who died shortly after birth, and found interstitial inflammation of the acoustic nerve progressing to the inner ear. (5) Cases due to mumps, osteomyelitis, typhoid, etc., in which infection probably comes through the blood.

Examination of a Deaf-Mute.—If the parents bring a very young child suspected of deaf-mutism, it is best to get someone to stand behind the case and, unobserved, to blow a whistle or clap hands. The doctor observes whether or not the child takes any notice. The mother often says that the child looks round when a chair falls or a door slams, but this is no proof of hearing ; such coarse vibrations can be felt. It is important also to test the mental faculties of the child ; this can be done by showing it a penny or a picture book—an idiotic child takes no notice of such things.

After the tympanic membrane and the nasal and pharyngeal cavities have been examined, Bezold recommends that the deaf-mute should be tested with his series of tuning-forks. If the forks b'—g" (the tones used in ordinary speech) are not heard, the child cannot be taught through the ear. By examining patients in this way Bezold found that 38 per cent. had considerable remains of hearing. Kerr Love advocates the use of a large dinner bell for testing the hearing of deaf-mutes. The child is blindfolded and

asked to count the strokes ; this method seems more suitable, for we must confess that it is often difficult to get a normal child, or even an adult, to give correct answers to tuning-fork tests. All deaf children should have their eyes examined, and any visual defect corrected as far as possible. Kerr Love states that among ordinary hearing children from 10 to 15 per cent. have defective vision, while among deaf children the percentage is 66. The nose and naso-pharynx should be attended to, not because there is any hope of improvement in hearing, but because articulation may be rendered more distinct.

Classification.—Deaf-mutes may be classified in various ways—(1) According to the amount of hearing present (Denmark) ; (2) according to the amount of speech they retain ; or (3) according to their mental ability (Schleswig-Holstein). As a matter of fact all three methods are usually employed together, so that the classification is somewhat complicated. In order to arrive at a proper classification all deaf-mute children should be sent at the age of 3 or 4 years to a preliminary school for a period of two years ; here they should have the chance of education by the oral method. At the end of this time they should be divided into—(1) *The semi-deaf and semi-mute*, who usually make up one-third of the whole number. The semi-deaf have some remains of hearing—a great help in the process of education. The semi-mute cases, in which deafness has occurred after the child has learned to talk, may have no hearing, but are able to speak in virtue of the hearing and speech which were formerly present ; the semi-deaf and semi-mute should be educated by the pure oral method. (2) *Those who are born completely deaf or become deaf so early in life that speech will not develop without special training* ; these make up two-thirds of the total cases of deaf-mutism. They again may be further subdivided into two groups, A and B, according to their mental ability (it is noteworthy that from 10 to 15 per cent. of deaf children are mentally deficient). It is necessary to remember that congenital deafness is not the same as total deafness—many so-called congenital cases have considerable remains of hearing—and, further, that acquired deafness is often complete, *e.g.* cases following cerebro-spinal meningitis are usually absolutely deaf. Cases belonging to group (2) should be educated by the manual or mixed (oral and manual) methods.

Education of Deaf-Mutes.—As early as 1648 Bulwer writes of a “lip-grammar which may enable you to hear with your eye, and thus to learn to speak with your tongue.” This lip-grammar or lip-reading is the backbone of the oral system (Kerr Love). The first school in this country was started in Edinburgh by James Braidwood in 1760, and was named Dumbiedykes. Braidwood used the oral method, but kept it secret. Five years later the Abbé de l’Epée began to teach his method, namely the deaf and dumb finger alphabet, in Paris. He made no secret of his teaching, which has now become known under the

name of the "French" method. Little need be said in regard to this method. Most people are acquainted with at least some of the letters, but few normal people can read or form them quickly enough to carry on a conversation; for this reason the deaf-mute who can only use the manual method has a very restricted number of people to whom he can talk. The pure oral system, on the other hand, was first generally adopted in Germany and Holland, and is now known as the "German" method. At the congress in Milan in 1880 this system received a great impulse; as one enthusiast there put it, "a person born deaf, and not educated, is imprisoned in awful solitude. The finger alphabet allows him to associate with his fellow-prisoners. The oral system throws open the doors of captivity and sends him out to take his part in the world." According to Kerr Love a normal child learns to speak by trying to reproduce the words which it hears its mother pronounce. The child at first makes free use of signs and gestures to supplement its speech, but, later on, these are discarded, though most of us use gestures to a certain extent. This is well exemplified by the answer usually given to the well-known question, "Can you describe a spiral staircase?" Deaf-mutes can be addressed through the eye (1) by means of objects or pictures, signs, and gestures; (2) by the finger alphabet; (3) by writing; (4) by lip-reading. Such children have to be taught that spoken words have the same meaning to our minds as pictures and signs have to theirs. They are therefore required to change signs for words until the written or printed characters are as readily understood as the picture or sign. It is very difficult to get deaf children to use their voices at all, as sound has no meaning for them; the deaf child sees you open your mouth in speaking but hears nothing. In teaching the oral method some begin with the vowels, others with consonants; such sounds as K are very difficult for the deaf child to reproduce. Simple combinations of vowel and consonant follow next, then short phonetic words, and finally sentences. Lip-reading, articulation, and writing should be simultaneous. To acquire a new word the pupil first reads it from the teacher's lips, he is next taught to pronounce it himself, and finally to write it down; deaf-mutes can write as well as normal children. The deaf child may lip-read "hat" or "run" but may not know what they mean. He must therefore be shown a hat, or the teacher must run, so that the child may associate the object or action with the word. Later on adverbs are introduced, *e.g.* "slowly" and "quickly;" the teacher illustrates these words by walking slowly or quickly. Adjectives are not difficult, but pronouns are a great stumbling-block; for instance the teacher points to himself and says "I," he then points to the deaf child and says "you." When the child tries to reproduce this he of course points to the teacher and says "I," and to himself and says "you." The tenses of verbs are also very difficult, and the reader will understand that "I shall have

run" presents considerable difficulty to a deaf child. The order of words in a sentence is another stumbling-block, because to the deaf it is a matter of pure memory; to a normal person a word out of place "sounds" wrong, but deaf children have no sound to go by and they consequently misplace or omit words. This oral system takes eight years at least, and necessitates small classes of not more than eight or ten children. The objection to the mixed system of education in use in Edinburgh (a combination of the oral and manual method) is that signs tend to become dominant and speech recessive. Donaldson's Hospital is the only school in this country where deaf children and normal children are educated together; this is an advantage to the deaf children, because out of school hours they converse (as a rule on their fingers), with the normal children, who teach them a certain amount of "slang" which is of great use to them in after life. If education be regarded as an end in itself the manual method is the quicker, but there can be no doubt that the oral method is the ideal one; the latter is, however, of little use unless the deaf child can be trained to make himself understood by normal hearing people. The writer of this abstract has not so far met an absolutely deaf child, who had never been able to speak, whose articulation he (the writer) was able to understand without frequent and painful repetition. The child's teacher is, however, often able to make out what it says, and probably the relations and intimate friends of the child would be in the same position. In many cases the most that can be attained is that the child should be enabled to converse with normal people by means of writing. The voice of the deaf-mute in congenital and early-acquired cases is always harsh and unnatural, as there is no variation of tone although articulation may be fairly good. In America Bell's *Visible Speech* is used in some institutions; in this method pictures showing the position of the tongue, lips, teeth, &c., during the pronunciation of the different letters are exhibited, and the deaf child tries to imitate them. Many of the semi-deaf have sufficient hearing left to be of use for educational purposes. The word to be learned is spoken in a loud tone into the child's ear, and at the same time the child by means of a hand mirror watches the lips of the teacher; in this way both the eye and ear are educated together. One Edinburgh authority has informed the writer of this abstract that he hates to be seen talking to a deaf-mute in public; it is necessary to repeat sentences over and over again and to talk in a laboured manner. When the child speaks everyone turns to look on account of the unnatural tone of the voice. It is possible to tell such a child, or class of children, as much in five minutes by the finger alphabet as in half an hour by the oral method. These children can make out simple oral questions such as "How are you?" "What time is it?" but they cannot follow a more elaborate conversation, as when the teacher tries to tell them about the sights seen on a

journey. Kerr Love is of opinion that the German plan of teaching all deaf-mutes by the universal application of the oral method is like fitting all kinds of defective vision with one type of spectacle. In spite of the universal application of the oral method, the adult deaf in Germany make free use of signs or mimic gestures. Even in the best oral classes in Germany and America a large percentage (10 to 30) are admitted to be oral failures, and every oral failure is a source of danger to the oral successes, because he uses signs and so contaminates the others.

Another vexed question is that of "Residential *versus* Day-Schools" for deaf-mutes. Here, again, classification comes in. The semi-deaf and semi-mute children, who are usually oral successes, are probably best taught in a day-school. If their homes are not satisfactory they may be boarded out with suitable foster-parents, and thus have the advantage of conversing with normal people out of school hours. On the other hand, cases of complete congenital or early-acquired deafness are probably best in a residential school, where their food and general health can be well attended to and where lectures may be given in the evening. In Edinburgh the sexes are educated together all along but are separate out of school hours.

Expenditure.—Germany, America, Denmark, Canada, and probably other countries spend more on the education of their deaf than Great Britain. According to Kerr Love the rate for deaf children in Glasgow was £35 in 1907, while in Canada it was £43; in Denmark in 1906 the cost of each deaf child was £45, and this sum was said to be constantly increasing. In this country the usual practice is to send the child to school at the age of 7 years. School boards are not permitted to pay for the education of the deaf beyond the age of 16. With our short period of school training and our limited money grants it is a difficult matter to do the best possible for the deaf child. According to Kerr Love the school period should be extended in both directions; a deaf child should be admitted at the age of 3 or 4 years, and should be kept at school until 18 or even 20. During the last four years of school life the pupil should be made to study a trade in addition to continuing his mental education. Kerr Love rightly maintains that in the long-run the State would gain, because more of the deaf would be self-supporting.

The Adult Deaf.—Both the authorities on deaf-mutism in Edinburgh are agreed that their pupils get on better in the world if they have fairly good articulation and keep it up. It is therefore of great advantage to the deaf to be able to speak, even if only fairly well; their mates soon learn to understand them. The director of the deaf-mute school at Nyborg in Denmark says that almost all his former pupils use their speech in after life as an essential means of communication with those around them; it must be remembered, however, that

these are picked cases. Recent legislative enactments, such as the Workmen's Compensation Act, are a great handicap to deaf people, who are not accepted for positions where there is any possibility of danger because they are unable to hear a warning cry. In Birmingham and in Glasgow the Educational Committees have recently established evening classes in lip-reading for men and women between the ages of 16 and 40 who were able to hear earlier in life, but have since become totally or extremely deaf. The teacher is the headmaster of one of the day-schools for the deaf, and has under him two assistants who teach on alternate evenings in order that the students may have an opportunity of practising lip-reading from different individuals (Kerr Love). It is advisable here to issue a note of warning so that deaf people may not expect too much from lip-reading. Many of them hope to be able to attend a lecture or even a theatrical performance, and to be able to take in all that is said merely by lip-reading. This is quite impossible, although they may be trained to understand almost all that is said to them in their home life. The English language is probably one of the worst in the world for lip-reading. Some of the best adult lip-readers say that they really only make out about 50 per cent. of the words spoken, and that they guess the rest. Even normal people at a theatre or lecture miss a certain number of words, and have to fill in the blanks from the context.

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THERAPEUTICS.

By F. CHARTERIS, M.D.

SALVARSAN MILK.

ACCORDING to Taege and Duhot it is possible to treat congenital syphilitics by injecting the mother with salvarsan. Though the milk contains only an infinitesimal quantity of arsenic it is powerfully

curative owing to the fact that it probably contains antibodies formed in the maternal tissues through the destruction of the spirochaetes. These two authors, indeed, went so far as to state that the milk of a syphilitic woman who had undergone salvarsan treatment was the best method of treating syphilis in the nursing infant. It was even suggested that it should have for choice a syphilitic wet-nurse, if the mother was unable to undertake the lactation. More recent investigations of Jessioneck (*Munch. med. Wochenschr.*, 30th May 1911) have thrown considerable doubt upon these claims of Taege and Duhot. He states that after intravenous injection of salvarsan the milk does contain appreciable quantities of arsenic, and he has detected it on the fifth day after the injection. The same holds true for goat milk, which for some days after the administration of salvarsan contains arsenic. It is not clear in what form the arsenic exists. He found that the salvarsan milk undoubtedly exercised a powerful effect upon the syphilis of the child, but in addition to the therapeutic influence he also noticed a curious effect produced in the first few days the milk was administered. In treating syphilis with salvarsan it is not uncommon to observe a "Herxheimer" reaction, viz. an inflammatory hyperemia surrounding the pre-existing cutaneous lesions. In two infants suffering from congenital syphilis the mother's milk produced, in the first two days after the salvarsan injection, a well-marked roseolous syphilitic eruption on the skin, though before this each child had been quite free from such rash. This, therefore, was not an intensification of a pre-existing rash, but rather the bringing out of a quite new eruption. The eruption in the one case was not attended by any severe symptoms, but in the second case the child became seriously ill, and did not improve till the mother's milk was stopped. The eruption did not last more than a few days, but in each case it reappeared on giving the mother a second injection of salvarsan. Ehrlich, in discussing the therapeutic possibilities of salvarsan milk, suggested that the antibodies produced in the mother's tissues passed into the milk and were absorbed by the child. Jessioneck points out that the antibodies are formed after the destruction of the spirochaetes, and it is, therefore, equally probable that in the first few days the milk will also contain endotoxins set free by the destruction of the spirochaetes. In Taege's and Duhot's cases the salvarsan was injected into the gluteal muscles, and hence the absorption of the drug was not very rapid. In Jessioneck's cases the salvarsan was injected directly into the vein, with the result that the destruction of spirochaetes was probably much more energetic, and consequently there was a greater liberation of endotoxins. These endotoxins passed into the mother's milk, and on absorption by the child result in some change in the spirochaetes of the infant, possibly sensitising them, which is manifested clinically by the cutaneous rash. As regards the factor in the milk, which induces the beneficial influence

upon the infant's condition, Jessioneck thinks that in addition to the antibodies the arsenic may also play an important part. To test this theory he fed a child aged 5 years, who was suffering from acquired syphilis, with the milk of a healthy goat which had been injected with salvarsan. The syphilitic manifestations cleared up in a very rapid fashion, which showed that the specific antibodies are not necessary. As the result of his unfortunate clinical experiences, Jessioneck warns against the use of salvarsan milk immediately after injection of the drug into syphilitic subjects. During the first few days the milk contains large quantities of endotoxins, and the absorption of them may seriously damage the child.

THE EFFECT OF ARSENIC ON METABOLISM.

Croce (*Zeitschr. f. klin. Med.*, 1911, Bd. xxxii. H. 1 u. 2) has investigated the influence of arsenic upon the metabolism of growing rats. By means of a series of comparative experiments he was able to show that young rats receiving arsenic along with their food increased more in weight than control rats receiving no arsenic. The arsenic was administered in two forms—(a) as the natural Val Sinestra mineral water, which contains 0.0453 grms. As. O_3 in each 10,000 grms. of water; (b) in the form of Fowler's solution, diluted so as to contain the same quantity of arsenic as the Val Sinestra water. Whichever way the arsenic was given it resulted in a great increase in weight over the control, which only received water. To determine how the arsenic produced this increase he carried out certain experiments (a) in which the animals received a weighed constant diet which they were able to consume entirely, and (b) in which the rats were allowed to consume as much as they liked. In both cases the animals with arsenic gained in weight, hence the action cannot simply be due to stimulation of the appetite, since in the (a) experiments the quantity of food consumed was the same by both the arsenic animals and the controls. Examination of the urine showed that there was no undue retention of nitrogen by the arsenic animals, so that Croce was forced to the conclusion that the increase in weight under minute doses of arsenic depends upon some diminution in the oxidation processes which leads to a lessened metabolism.

THE USE OF ASCITIC FLUID HYPODERMICALLY.

Carter (*Journ. Amer. Med. Science*, Aug. 1911) has for some time been interested in the problem how to administer protein hypodermically. In the dog it is possible to administer enough protein in the form of fully pancreatised milk to keep the animal nearly in nitrogenous equilibrium, but the method is dangerous and possesses no therapeutic

value. More recently he has tested two other plans which seem of more value, viz. the administration of a mixture of gelatin with amino-acids obtained from meat proteose and the use of ascitic fluid. The later plan is the simpler, and is the method described in the paper. The ascitic fluid is obtained either from cases of hepatic cirrhosis, free from all trace of toxæmia, or from cardiac cases. The content of protein varies in the different fluids, and may even vary in the same patient with different tapplings: hence it is advisable to estimate the content of N. To obviate any danger of transmitting disease a Wassermann reaction should be done, and the serum injected into a guinea-pig to eliminate tubercle.

Experiments on dogs showed that for short periods it was possible to maintain the animals very nearly in nitrogenous equilibrium by hypodermic injections of the serum. The nitrogenous loss was less when 0.4g Nero kilo bodyweight was injected subcutaneously than when 0.6g N pro kilo bodyweight was administered by the mouth. The nitrogenous content of ascitic fluid is so low that even 0.4g N per kilo bodyweight represents a large bulk of fluid, and it is inadvisable to attempt to inject the whole protein requirement. Large amounts of the ascitic fluid may cause transient œdema and embarrass the kidneys, though it does not produce a true nephritis. It is always advisable when injecting the ascitic fluid to give the patient an extra supply of water either hypodermically or by some other route.

Theoretically the subcutaneous administration of protein is indicated in various clinical conditions, viz. (1) when the body is unable to absorb protein by the ordinary channels: (2) in conditions when the tissues are dried up owing to loss of fluid from vomiting, diarrhoea, etc.: (3) when the system is being overwhelmed with a toxin for which no specific antitoxin exists: (4) where growth is interfered with, *e.g.* in marasmus (ascitic fluid injected in small amounts markedly improved the nourishment of mice suffering from sarcoma): and lastly (5) in various blood conditions in which serum has proved of value, *e.g.* hæmophilia, melæna neonatorum, etc.

Clinically Carter has tested the value of hypodermic injection of ascitic fluid in nine cases of very severe gastro-intestinal catarrh which had failed to react to other treatment. In three of the cases the therapeutic result was very good. Two cases cured after a single injection, and the third case improved immediately after the injection and for the next week steadily put on weight, but died suddenly without any detectable lesion. It is advisable to begin with a small dose of from 15 to 30 c.c., and as the treatment is still in the experimental stage Carter advises that if the injection is followed by improvement the injection should not be repeated. If there is no amelioration produced the injection may be repeated in twelve hours. In one of his

cases he gave for eight days from 20 to 30 c.c. daily of an ascitic fluid which contained 0.34 per cent. N.

UROTROPINE.

Chauffard (*Sém. Med.*, 8th March 1911) strongly advocates the use of this drug in the treatment of acute infections of the biliary passages and in enteric fever. He has been able to confirm Crowe's statement that urotropine is rapidly excreted by the bile in five cases where there was biliary fistulas. In those cases Grigaut was able to show that after daily administration of a small dose of 1 to $1\frac{1}{2}$ grms. the excretion was abundant during the succeeding 24 hours, but it was impossible to detect any trace of the drug 48 hours after administration of these doses. It is not clear in what form urotropine is eliminated, probably unchanged, as no free formaldehyde could be demonstrated. Urotropine in 0.5 per cent. solution possesses considerable antiseptic value, and it is calculated that with a dose of 10 grms. daily the biliary secretion would contain more than this percentage of urotropine. As the result of his investigations with Grigaut, Chauffard considers that it is thoroughly established that the biliary excretion of urotropine is constant, rapid, and as intense as that by the urinary tract. Using the small dose of $1\frac{1}{2}$ grms. daily, Chauffard has obtained excellent clinical results in several cases of acute infectious angiocholitis. He thinks there is an excellent field for the drug in enteric fever. As the result of the recent experimental work he thinks it proved that enteric fever commences as a blood infection, and that the bacilli are passed into the intestinal tract by the biliary secretions. In animals it has been shown that the infection of the bile tract is hæmatogenous, and not due to an ascending infection from the intestine, and that the excretion of bacilli by the bile goes on for some days after the bacilli leave the blood-stream. The sequel of events is as follows:—Infection usually by the intestinal tract, followed by septicæmia, then bacillocholia: infection of the intestinal tract, often with bacilluria: the disease terminating more or less slowly by the immunisation of the patient. The bacillocholia plays an important part by causing angiocholecystitis which may be acute or subacute, and which may develop immediately or in after life. He also ascribes to the biliary excretion an important part in the production of prolonged fever and relapses. It is a common observation that a relapse is frequently determined by the administration of a more ample diet. He thinks that this may be due to the extra food acting as a stimulus to the biliary secretion. If the bile contains bacilli the extra output of bacilli may cause a fresh infection of the intestine. It has been stated that in such cases slight signs of angiocholecystitis precede the relapse. On account of these theoretical considerations he advocates the administration of urotropine as a

routine treatment during typhoid fever, not as a substitute for, but along with, ordinary treatment with cold baths, etc. In cases which he has treated on this plan he was struck with the diminution in the urinary symptoms. The albuminuria is reduced and the indican output is markedly diminished. He considers that the good effect on the bacillocholia and bacilluria is thoroughly established, while further investigation is required to determine whether it is equally efficacious in respect of the bacteriæmia and intestinal symptoms. He illustrates his contention by publishing notes on a case in which, during the third week of the disease, the patient began to have rigors with deep pain in the right hypochondriac region without any definite swelling of the gall-bladder. After this had gone on for eight days Chauffard was called in to see the patient and advised the administration of $\frac{1}{2}$ grm. of urotropine thrice daily. The response was immediate and the temperature promptly fell to normal, the rigors ceased, and convalescence was undisturbed. As regards the dose in which the drug should be administered, he points out that it is not possessed of much toxicity and is non-cumulative. As much as 10 grms. can be given in the day, though with such large doses there is sometimes irritation of the urinary tract with frequent micturition and hæmaturia. For an adult without any urinary trouble the amount he advises is 2 grms. daily in divided doses of half a grm. In serious cases this amount may be quite safely increased to 3 grms. in the day.

NEW BOOKS AND NEW EDITIONS.

Manual of Human Embryology. Edited by FRANZ KEIBEL and FRANKLIN P. MALL. In two Volumes: Volume I. Philadelphia and London: J. B. Lippincott Company. 1910.

MINOT'S Human Embryology, published first in 1897, marked a distinct advance in English text-books of embryology. Not only was it written by a most competent and learned embryologist, but it gave an especially good exposition of the placenta and cord, which has been of the greatest service. Minot wrote it, however, with the full armour of literature displayed in the text, and this somewhat detracted from its value owing to the necessary want of condensation. It still remains, however, one of our best guides, and one to which the investigator will always turn.

The present work is edited by and contributed to by two eminent embryologists and anatomists. Keibel's work on the development of the posterior end of the early human embryo and his models of the stages are well known, while Mall is also a teacher of repute and an

authority on the early human embryo, both in its normal and pathological conditions.

The staff of contributors is large, and is composed of those who have specially studied the subjects on which they write.

Grosser's article on human placentation is exceedingly good, and he considers certain features in it, viz. the fibrin layers, often slurred over. The nomenclature is modern, and the whole subject considered succinctly, sometimes too much so. A notable instance of this is in regard to the umbilical cord.

The chapters on the development of the skin (Pincus, Bardeen), on bone, and on muscle (W. H. Lewis), are especially good. The last is both striking and novel.

There is little philosophising in the work; usually one gets too much of that, but here the writers have carried their reticence on this head a little to excess. There may, however, be a special chapter on evolution problems in Volume II.

The second volume will be eagerly looked forward to, especially the chapters on the origin of the primitive germ-cells, and of the urinogenital system—the fundamental part of embryology.

This work should have a great influence in stimulating embryological investigation in this country.

Mind and Health. By EDWIN ASH, M.D. Pp. 119. London:
H. J. Glaisner. 1910. Price 2s. 6d.

THE alternative title, though lengthy, is more descriptive of the scope of this book. It runs: "The Mental Factor and Suggestion in Treatment, with Special Reference to Neurasthenia and other Common Nervous Disorders." The author has kept the practical utility of suggestion steadily before him, and his aim has been reached; for here in brief space the student and the practitioner will find most helpful counsel, and thereby many a patient may be successfully treated by the legitimate sons of Æsculapius. Dr. Ash generally uses suggestion without hypnotism, considering that the uncertainties of the latter method, and the distaste with which it is regarded by the public generally, should lead us to practise mental treatment without it if possible. Suggestion and ordinary routine methods should go hand-in-hand. There are some pertinent observations on so-called "homes" for nervous patients, when the failure of the treatment may be explained by the want of a congenial, bright, and helpful environment. Special attention is paid to the details of treatment in various nervous disorders, mainly of the functional type, of course.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL NOTES AND NEWS.

Medicine as a Profession. It is not very easy to write this year on the prospects of those who are taking up the profession of medicine. While we cannot bring ourselves to take the extreme pessimistic view voiced by some of our contemporaries, the Insurance Bill still hangs like a cloud over the future, and it takes some faith to go forward. Can it be that Mr. Lloyd George is unconsciously acting the part of Gideon, and that those who this year—greatly daring—enter on the study of medicine will, like his three hundred warriors, win in the end a great victory? Metaphors apart, the art of medicine is too great to be destroyed by any legislation, however well intentioned, and there will always be room, and an adequate living—at the top. And so we say, if a young man feels the call to the healing art let him take courage: he has chosen a hard road but a noble destiny, and the sound common sense of the country will come to see that the labourer is worthy of his hire.

The New Ordinances. As is noted in our special educational pages the New Ordinances are now in force, though following custom, students who began under the old have the option of finishing under either.

The most important change is the earlier position of the second professional examination, which the student who begins in summer (and we are glad to note that he is invited to do so by the model curriculum based on that supposition being placed first) can go up for at the end of his second winter. He who begins in winter cannot go up till July, when though, in a sense, he catches up those who began earlier, he has so much less time to devote to his final subjects. As these are under the New Ordinances far more numerous—all the subjects formerly alternative being made compulsory—the advantages of beginning in summer are so obvious that we hope there will be a return to the old custom of beginning the study of medicine in May.

The Insurance Bill. THIS month will see Parliament again in session, and the Insurance Bill once more in the melting-pot. We are not greatly terrified by the fulminations of the

Friendly Societies. Resolutions—even unanimous resolutions—that they must have “control of their own doctors” leave us unmoved. One thing surely the medical profession has gained from all this controversy — we are done with that control. We have no intention of insisting on any pounds of flesh, but we have learnt sufficient of our own strength not to play the part of a passive Bassanio any longer. At least we shall have learned it if we stick together. The temptation to a man who has a large club practice to cast in his lot with the societies is evidently counted upon by these bodies, who, we learn, are endeavouring to detach such practitioners from the main body. Surely the knowledge that this is only a preliminary to sniping them one by one will prevent any serious defection.

As it now stands, the Bill has grafted on it the majority of the suggestions of the General Medical Council. The control of medical matters now lies with the health committees, and these we hope will in the end be so composed as to deserve more of the confidence of the profession than was foreshadowed in the draft. Special medical committees will elect two representatives to each health committee and will negotiate generally with them. These medical committees will have powers in certain directions far transcending those of the General Medical Council. That body has only one penalty to enforce, and that so severe that the minor offences of conduct are never brought before it.

The free choice of doctors was so obviously what each of them insisted on himself, that the members of the House of Commons accepted it unanimously.

Dr. Addison's amendment on the wage-limit question is very nearly what is known in temperance circles as local option. It has its drawbacks—all compromises have—but the great differences in circumstances, in wages, and in the cost of living in different parts of the country are all arguments in its favour, and, given loyalty and cordial co-operation on the part of every doctor, male and female, in the country, we believe it can be made to work. But that is the *sine qua non*; there must be loyalty.

As we go to press we learn that a new development has arisen. Mr. Lloyd George has invited the British Medical Association to send representatives to a conference with himself and representatives of the Friendly Societies, and the Association has accepted the invitation. The conference will meet on 9th October, and the results of its deliberations will be awaited with much concern.

The Quincentenary of St. Andrews. It will be long before those who were fortunate enough to take part in the celebrations of the five hundredth birthday of Scotland's oldest University will see as picturesque a sight. St. Andrews is peculiarly fitted to form the stage

of such academic functions, and the gorgeous academic robes which lit up the grey streets of the old city seemed to fit in with their surroundings, as they do not in our busier streets. Everything went off well, and those who were privileged to hear the addresses of the Chancellor and the Rector (Lords Balfour of Burleigh, and Rosebery) had an intellectual treat. Both of them members of English Universities, they have both caught the spirit of St. Andrews, that collegiate spirit which is less prominent in our three larger Universities. There is an "If I forget thee O Jerusalem" spirit which the St. Andrews graduate possesses in exceptional measure.

The honorary degrees, which were, as is usual on such occasions, numerous, and, according to the Vice-Chancellor, all unsolicited, were bestowed on distinguished representatives from almost every quarter of the globe. Medicine was well represented, no fewer than eighteen out of the eighty-six LL.D. belonging more or less to our profession. Among them were Professors Crum Brown and Schäfer, Dr. Byrom Bramwell, Sir Hector Cameron, and Mr. George Berry.

It is sometimes commented on as an interesting fact that two of our Scottish Principals are medical men: three of the doctors who represented Continental Universities appeared in the robes of Rector or Pro-Rector. There are evidently men of affairs in the profession abroad as there are at home.

We do not think the advantages of St. Andrews as a medical school are sufficiently recognised. It cannot, of course, pretend to give, and it does not attempt to give, in St. Andrews a complete course. For his clinical work the student must migrate to University College, Dundee, or, like his fellow-student in Oxford and Cambridge, to some other centre. But the first two years in St. Andrews will stand comparison with any other school, and the small size of the classes permits of an amount of personal attention and direction which some students at least are all the better of.

Resignation of Prof.

Finlay.

TIME was when only death caused a vacancy in a University Chair or an Episcopal Throne, but times are changing, and each of our Scottish Universities has now Emeritus Professors who to all appearance are as vigorous as ever, and the Bishop of Ripon has intimated his intention of laying down his crozier in a letter breathing almost exactly the same sentiments as were expressed by Professor Ogston when he announced his resignation.

Professor Finlay must surely have been reading these letters, for his resignation must have come as a surprise to most. No one has been saying that it was time Finlay was making way for a younger man, and one reads in *Who's Who* the fact that he was born in 1840 with some incredulity. He has done excellent work in Aberdeen. Of

course he had good material to work on, but there was no lowering of the standard when Finlay was examining. He will be missed on the General Medical Council. He did not speak much, but when he did everyone listened attentively. We do not know if, like some others of his emeritus brethren, he is going to turn his attention to politics, but medicine could do with some such representatives in the House of Commons.

Appointments.

DR. FRASER HARRIS, formerly Lecturer on Physiology in St. Andrews, and more recently in Birmingham, has been appointed to the newly founded Chair of Physiology in the University of Halifax, Nova Scotia.

The duplicate chairs in Glasgow have at last been filled up as follows:—*Medicine*—Walter K. Hunter, D.Sc., M.D. *Surgery*—Robert Kennedy, M.A., D.Sc., M.D. *Obstetrics*—John M. Munro Kerr, M.D. *Pathology*—John H. Teacher, M.A., M.D. They will carry out their teaching in connection with the Royal Infirmary.

Dr. Byrom Bramwell has been appointed Physician to Chalmers Hospital, Edinburgh.

Dundee Royal Infirmary.

CONSIDERABLE changes have taken place on the staff recently. Professor MacEwan, having reached the term of his service, retires, and Mr. Greig becomes Senior Surgeon. Mr. Don succeeds Mr. Greig as Second Surgeon, and Mr. Price becomes Junior Surgeon. Dr. Low, now Senior Assistant Surgeon, takes charge of ten beds, and the retirement of Dr. George Whyte made an additional vacancy on the assistant staff. Mr. W. L. Robertson, M.B., F.R.C.S., and Mr. John Anderson, M.B., Ch.B., have been appointed Assistant Surgeons.

Bequest to Scottish Hospitals.

THE late Mr. Edward Davis, of Cheltenham, has left the residue of his estate, amounting, it is believed, to seventy-five thousand pounds, to his trustees, with directions to divide it between such general hospitals and infirmaries in Scotland as they shall select.

A CONTRIBUTION TO THE THEORY OF ENZYGOTIC
(MONOCHORIONIC) TWINS.

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Introductory.—In the course of an inquiry into the possible autonomous unit-characters making up the human frame, the case of enzygotic twins came up, and as it forms a distinct and interesting section of this general question, it lends itself to separate consideration. Another reason is that Dr. Ballantyne has often brought the occasional deformity of such twins before us, without, I am afraid, receiving as much encouragement as he should have. I am, however, specially indebted to him for his many valuable communications, as without these it would have been impossible for me to have taken up this subject.

Two of the most interesting kinds of enzygotic twins are those of identical twins and the allantoido-angiopagus forms.* The latter usually consist of a normal twin and a deformed one, the deformities being very frequently those of exact defect. Such twins are derived from one fertilised ovum (zygote), and are therefore monochorionic or enzygotic (one-zygotic), as I have termed them. They are always of the same sex; the umbilical cords communicate near the placenta, and the sexual organs are usually normally developed and always similar. We may also have twins which are completely separated from one another except that the cords may unite, or those whose bodies are more or less united.

The classification given is as follows:—B. Polysomatous (two (or more) individuals involved), but monochorionic. I. Twins, entirely separate. II. Twins, united only by the vessels of their umbilical cords (omphalo- or allantoido-angiopagus). (a) Para-cephalic; (b) acephalic; (c) amorphous. III. Twins, united more or less completely (double monsters). (a) Symmetrically united—(1) Syncephalic; (2) dicephalic; (3) thoracopagus. (b) Asymmetrically united—(1) Cephalo-parasitic; (2) prosopo-parasitic; (3) trachelo-parasitic; (4) thoraco-parasitic; (5) gastro-parasitic; (6) lecano-parasitic; (7) melomelic (slightly modified from Ballantyne).

* Twins with the umbilical cords communicating. I shall discuss the correctness of the term later.

Explanatory.—The human zygote (*i.e.* fertilised ovum) usually develops into a single foetus. In a certain proportion of cases, however, two perfectly normal foetuses are formed from the one zygote, and these may be exactly similar, and are then termed “identical or fraternal twins.”* These are always of the same sex, have been completely separated, and may be so alike in every way in adult life as to be often mistaken for one another even by those who are familiar with them. Identical triplets and even quintuplets may occur.†

In the allantoido-angiopagus twins we have a similar condition of identity, but one only is perfect, or nearly so, the other may be, by defect, so deformed as well to deserve the term monster. Thus the head may be wanting; the trunk, on the other hand, may be absent or very defective; and finally only the head may be present. The internal viscera may be defective or wanting, and the defects may be so serious that the foetus can only exist as an apparent parasite.

The two foetuses may, however, be more or less joined, and thus we have the well-known double monstrosities given at III. in the previous table of classification. In such the sexes are also always similar, and the internal genitals normally developed. Certain peculiarities are present in the intestinal tract, as in cases recorded by Berry and Kamann.

In considering these remarkable and, at first sight, seemingly inexplicable anomalies, one must start with identical-separate twins, and endeavour to determine exactly, so far as we can, *what happens when normal and healthy identical twins are formed.*

Hitherto this question has usually been answered by the words, “an equal primary cleavage division gives rise to two halves of the zygote, and each of these develops as a foetus.” This, however, does not lead us very far, and the statement has been disputed, as we shall see.

In the modern conception of Evolution we owe to Weismann we look on a zygote in its somatic part‡ as containing determinants which are the elements in the zygote causal to the future developed organs—the determinates—of the adult, and we may say, no determinants, no determinates. These terms form a merely hypothetical causal terminology not demonstrable, and the real nature of the determinants is unknown.

* This is used as equivalent to male and female, like the German Geschwister.

† See Wilder, *Amer. Journ. of Anat.*, iii. 395.

‡ That part which will develop the “soma” or body.

Following Mendel we can further regard these determinants as causal to the adult autonomous unit-characters, and that in transmission they do not blend but interchange in heredity in a definite manner. In the plant-crossings Mendel and many others have practised, contrasted unit-characters have been shown to sift out unchanged in subsequent generations in definite ratios, and the point I have urged in this is that this is due to a ratio-arrangement *in the determinants* of the propagative part of the zygote, following the law of probability. This conception of the ultimate results being determined by what happens in this part of the zygote gives us an extension in Mendelism of the greatest value, and to understand the ultimate results in identical twins we must think in terms of the determinants.

When identical twins are formed there is either a halving of *all* the determinants (in the somatic part of the zygote), or a doubling of them *all*, the latter being more feasible, and then an equal segregation of them into two groups, thus making a complete division of the zygote determinants. In this way twins arise that are absolutely identical, even to the finger-prints, as Wilder has shown. Finger-prints are never identical in the single individuals of the human race, as no instance of such identity is known. Wilder's paper on this subject is most interesting.

We can think of reproduction in the amœba in the same way. Thus when a bud is formed we may consider that the amœba determinants have doubled and then segregated into two groups, and this is an analogy familiar to us all. Any incomplete doubling in this may cause a variation.

This description of doubling and segregation * involves that of equal division (often expressed as symmetrical cleavage of the zygote), and the ultimate results, complete equivalence and separation in the foetus and adult, come out thus as the result of zygotie changes. Equal cleavage as the expression of division is therefore unnecessary. When the zygote is formed there is a multiplication of the determinants so as to produce the primitive germ cells, and this may be repeated in single zygotes forming identical twins, and would give a feasible explanation of polydactyly and the rare case where five hearts existed in a single hen (see Schwalbe).

In identical twins the segregation of the doubled determinant groups is complete. Each foetus is equivalent and has its own

* This term is used in the ordinary sense of separation into a definite group.

umbilical cord, the cord being the posterior end of the embryo, as His long ago correctly pointed out.

When, however, all the determinants are not doubled but only certain of them, half of those that are doubled segregate to one side, and form an incomplete set, while the remaining set is necessarily complete, inasmuch as it has the determinants that are not doubled and its equal share of those doubled. Thus we get the paracephalic, acephalic, and amorphous varieties according to the amount of deficiency in doubling.

Where there is union of the twins, more or less, the cause is incomplete segregation, comprehending also incomplete division, and thus the varieties given at p. 297. The umbilical cord anomalies are likewise due to this incomplete segregation, inasmuch as the cord is part of the embryo.

Thus identical and allantoido-angiotropus twins may be considered as being due to complete or incomplete doubling, as the case may be, followed by complete segregation so far as the multiplied elements are concerned. If there is exact and complete doubling and complete segregation we get identical twins; incomplete doubling and segregation with consequently incomplete allotment gives us the many varieties classed as allantoido-angiotropus monsters, or united twins.

I must now consider some of the other views brought forward in explanation of the remarkable deformities occurring in enzygotic twins.

The communicating umbilical systems and the acardiac condition so often present seem to me part of the process and not to be causal. In the acardiac condition the cardiac determinants have not doubled, and therefore the healthy twin alone possesses a heart. The incomplete twin will necessarily have a smaller share of chorion and of blood-vessels, but this is a result, not a cause. All explanations based on the later growth of the allantois in one twin are open to the objection that the allantois plays a rudimentary *role* in the human species and is phylogenetic in significance. Twin embryos have also been found in the earliest stages before any allantois forms. The placenta is really an organ of the chorion, not of the allantois.

The explanation I bring forward is a simple one and explains the curious result in allantoido-angiotropus twins in an understandable way. It is only part of the rich heritage the work of Weismann and Mendel is giving to obstetrics.

It seems to me, finally on this head, important to note that

the explanations hitherto given of allantoido-angiopagus twins have assumed that they were due to changes in the formed fetus. The explanation I have urged is based first on Weismann's conception that what is the result in the developed organism is due to causal elements in the zygote. To Mendel's discovery that the organism is built up of autonomous unit-characters I add the view that the ultimate results in the adult organism are due to changes which have taken place in the zygote and the gametes forming it. This seems to me to introduce into our views of the formation of such monstrosities associated with twinning a simplicity and accuracy hitherto wanting.

The dissection of specimens of conjoined twins has yielded valuable results in the hands of Kamann, R. J. A. Berry, and many others. Professor Berry has drawn especial attention to the absence of the gall-bladder in one of the twins, and naturally says that it is inexplicable if twins result from a simple cleavage. He urges the following as his explanation:—

"It is safe to assume that the two embryos in each case have had only one yolk-sac between them; that is to say, they have been developed from one ovum.

"Commencing upon this hypothesis, and remembering the lateral nature of the fusion of the twins, I first assumed that two primitive grooves had been lying side by side upon a single ovum. I endeavoured to account for these two primitive grooves by assuming bilateral segmentation of the ovum, but I was forced to abandon this position as untenable, inasmuch as if worked out it will be found to necessitate the formation of two yolk-sacs and two amnions, and their subsequent conversion into single structures by fusion. Quite apart from these objections there are others of an even more insuperable character, and consequently this supposition of bilateral segmentation of a single ovum was subsequently abandoned in favour of the following theory, which appears to offer a more satisfactory explanation of the phenomena.

"1. *The Explanation of the Lateral Fusion and the Common Epiblastic Covering of the Fused Areas.*—This explanation is based on the supposition that the two embryos have been developed from a single ovum *without* bilateral segmentation. The two primitive grooves have lain side by side in such a way that the caudal ends of the embryos have been rather nearer to each other than the cephalic ends, or, at all events, the central portions of the primitive grooves have either been nearer each other than any other portions or have been in actual contact. What I then

suppose to have taken place is illustrated in Fig. 2,* and granting the original hypothesis—two embryos developed from a single ovum without bilateral segmentation—an easy explanation results as to the lateral fusion of the twins, even to the greater fusion in the second example than the first, and also as to the common epiblastic covering of the fused areas and the single jejunal tube. All are easy of explanation on this hypothesis, and difficult, if not actually impossible, upon any other.

“2. *The Explanation of the Single Duodenal and Jejunal Tubes and the Single Liver.*—The hypothesis adopted in the preceding paragraph assumes the presence of a single yolk-sac common to both embryos, and Fig. 3* illustrates my conception of the evolution of the single duodenal and jejunal tubes from this common yolk-sac. Both the pyloric ends of the duodenal tube have undoubtedly been developed from independent foreguts, whilst the intermediate portion, with the biliary duct and the single jejunum, have, in my opinion, been developed from the common yolk-sac or midgut. I say ‘in my opinion’ because such an assumption necessitates the liver being a midgut development, and the numerous works upon embryology which have been consulted appear to me to leave the question an open one. Keith, in his *Human Embryology and Morphology*, states that the foregut becomes the pharynx, œsophagus, stomach, and that part of the duodenum situated in front of the opening of the common bile duct: that is to say, he appears to regard the liver as a midgut development. With this I entirely agree, inasmuch as in both these cases there is but one common bile duct, which opens into the intermediate portion of the single duodenal tube. Thus the liver is proved to be a single structure common to both twins, and not two liver buds fused together, and as an additional argument in support of this view it may be stated that each liver has but one Spigelian lobe. For these various reasons I am therefore of opinion that these cases prove the liver to be a midgut development, and that Keith is perfectly correct in his views upon this point.

“The hypothesis upon which the lateral fusion was explained suffices, therefore, for the single duodenal and jejunal tubes as well as for the single liver.

“3. *The Suppression of the Gall-Bladder in the One Case and its Presence in the Other.*—As the gall-bladder is known to be developed normally as a diverticulum from the common hepatic stalk in the second month, it is perfectly easy to understand the

* See Berry's paper, *Edin. Obst. Trans.*, vol. xxviii.

suppression of this viscus in the one case and its presence in the other; it is at the same time impossible to offer any theory as to *why* the gall-bladder diverticulum should thus grow out in the one case and not in the other.

"That twin embryos do develop side by side upon a single ovum is proved by the remarkable case published by Miss Duncan in the *Proceedings of the Anatomical and Anthropological Society of Aberdeen*, 1900-1902, under the title of 'The Anatomy of a Double Chick Embryo,' and the cases with which this paper deals would further seem to prove that bilateral segmentation of an ovum is unnecessary for the evolution of twins. The condition of the alimentary canal proves conclusively that the twins in each case have possessed but one common yolk-sac; bilateral segmentation of a single ovum would result in two yolk-sacs, and hence these cases seem to afford indubitable proof of the truth of the hypothesis adopted herein, namely, double embryos on a single ovum without bilateral segmentation. Further proof of the truth of this theory is afforded by Kamann's 'Zwei Fälle von Thoracopagus tetrabrachius,' published in the *Archiv für Gynäkologie*, Bd. lxxviii. H. 3, where the condition of the alimentary canal in each case was identical with that recorded in the present paper. The present writer's (Berry's) theory, therefore, not only explains the two cases now under discussion, but also suffices for Miss Duncan's case and for those of Kamann. If these several cases and the resulting facts may be accepted as proving the writer's contention the labour and thought bestowed upon these embryological problems will not have been spent in vain, for two important scientific results follow:—(1) Bilateral segmentation of a single ovum is unnecessary for the production of twins; (2) the liver is a midgut development" (*Edin. Obstet. Trans.*, vol. xxviii.).

This does not, however, explain how the two primitive grooves arose. If not by bilateral segmentation of the ovum, then how? If one assumes that there are two primitive grooves to start with, no further explanation is necessary.

Any idea of polyspermy cannot in my opinion be entertained. Each spermatozoon would have half its chromosomes when matured to a gamete, while the ovum would have only its half sufficient for one gamete, and, as pointed out by Turner, identical triplets would require three male gametes and one female one. According to my theory there would be in identical triplets tripling of the determinants and a complete and equal segregation of the three groups.

The explanation I offer is as follows:—The twins Professor Berry describes arose from one zygote. There was doubling of the determinants, except in the case of the gall-bladder, with incomplete segregation and therefore fusion in the lateral line. The primitive gut was thus a common one, as the internal somatopleuric folds could not curve in, and only the outer one in each foetus did so. The amnion is a single one, because the solid plugs from which the amnion arose were double and fused.

The yolk-sac is a diverticulum from the common primitive gut and therefore single.

The explanation Dr. Berry gives as to the liver and circulatory conditions is excellent.

The view I have advanced explains, I think, Professor Berry's difficulty. The gall-bladder is single because its determinants were not doubled. Bilateral segmentation is not necessary for the production of twins; it is not even necessary for their separation. *It is the doubling of determinants in the zygote and their segregation that are the essential things*, and this involves the cleavage idea hitherto always used.

I may now sum up the process in each special case; each of course is formed from a single zygote.

Identical and Separated Twins.—Equal doubling of determinants; complete segregation.

Paracephalic.—Doubling of cephalic determinants; incomplete doubling of others; segregation of half of doubled determinants which thus form the paracephalic monster.

Acephalic.—No doubling of cephalic determinants but of the others, and thus deformed twin acephalic. The other twin possesses, of course, a head.

Where the monster twin is represented only by a head, leg, or arm the determinants of these alone were doubled and segregated.

In a previous paper in the *Edin. Obstet. Trans.*, 1910-11, I have endeavoured to show that in deformities in single foetuses the defect is due to loss of determinants when the ovum matures, *i.e.* when the polar bodies are thrown off. This holds good for single deformities not associated with twinning, and need not be further alluded to.

I now wish finally to consider the question of nomenclature.

The term allantoido-angiopagus does not seem to me a very fortunate one. In the first place the allantois is a rudimentary structure in the human foetus, and in addition the irregular distribution of vessels is a result, not a cause, of the condition.

The essential point about such twins is that they are developed from one zygote, and are thus termed enzygotic. The subjoined table gives the possible result in such cases when twinning is a result.

Enzygotic or Monochorionic Twins.

I. Complete and exact doubling or tripling of determinants; complete and equal segregation. *Identical twins or identical triplets.*

II. Incomplete doubling and complete segregation, part of funis excepted. Imperfect twin—Paracephalic, acephalic, amorphous.

III. Incomplete doubling and incomplete asymmetrical segregation—Cephalo-parasitic, prosopo-parasitic, trachelo-parasitic, thoraco-parasitic, gastro-parasitic, lecano-parasitic, melomelic.

IV. Complete doubling and symmetrical incomplete segregation—syncephalic, dicephalic, thoracopagus.

LITERATURE.—This is fully given in Schwalbe's *Missbildungen* and Ballantyne's *Antenatal Pathology*.

The following extracts from de Vries' *Intracellular Pangenesis* (Chicago, 1910) are of value :—"We must therefore assume that they" (the pangens, Weismann's determinants) "assimilate and take nourishment, and thereby grow, and then multiply by division, two new pangens like the original one usually originating at one cleavage" (p. 70, Gager's translation).

"This process of dispermia" (fertilisation of one ovum by two sperms, Boveri), "leads to . . . a triple number of chromosomes, . . . and then . . . the germs . . . show deviations from the normal type" (do not form identical organisms) (*op. cit.* p. 235).

INTRA-NASAL CARCINOMATA.

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and

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INTRA-NASAL malignant disease is distinctly rare, and this rarity is all the more striking when compared with the frequency with which benign nasal growths are met with.

Sarcoma, endothelioma, and carcinoma all occur. Clinically they are very similar. Sarcoma is the commonest of the three forms, and occupies an intermediate position as regards malignancy ; endothelioma is the rarest but least malignant ; while carcinoma is the most malignant. As showing their rarity, Kümmel¹ in 1896 could only find recorded 69 cases of sarcoma and 40 of carcinoma ; in 1904 Donogány and von Lénárt² brought the number of cases of carcinoma up to 80 ; while it may be mentioned that in Fraenkel's clinique, out of a series of 40,000 cases of nasal disease there were only 5 of carcinoma.

Carcinoma of the nose appears to be about three times as common in men as in women (Trantmann and Gebhart³), and usually occurs after the age of 45. Various factors have been mentioned as having an influence in its etiology, including previous disease such as chronic inflammation and more especially simple polypi, also trauma, under which heading may come repeated extraction of polypi.

Site.—Many opinions are expressed as to the primary site of origin, the only general agreement seeming to be that the disease is often so far advanced that it is impossible to fix the point of origin. Kümmel gives as the order of frequency—(1) anterior part of the septum of the nose ; (2) lateral wall ; (3) roof of the nose. Donogány and von Lénárt, from an analysis of 42 cases in which the site of origin could be ascertained, give the following figures:—middle turbinate, 21 ; inferior turbinate, 9 ; septum, 6 ; roof of nose, 3 ; sphenoid bone, 2 ; antrum of Highmore, 1. Tissier,⁴ with whom agree Citelli and Calamida,⁵ considers that the most common starting-point is in the ethmoid cells or roof of the nose ; Kümmel, on the other hand, states that he knows of no certain primary ethmoid case. Schmiegelow⁶ records one of the few certain cases starting primarily in the sphenoidal sinuses.

There seems to be a common tendency for carcinomatous growths in the nose to assume a papillomatous shape.

Symptoms.—Amongst the early symptoms there is nothing very diagnostic. Pain is commonly complained of, varying in character, degree, and situation, but usually described as being deep in the head. Unilateral stoppage of the nostril is frequent and important. Bleeding is much less common than in cases of sarcoma. On examination there may be seen an irregular, horny, reddish-grey tumour, generally eroded on the surface and with a foul-smelling discharge. The growth may be felt in the posterior nares as well as in the anterior. There is not the same tendency as in sarcoma to the fusion together of parts of the nose; the tumour tends to break down almost as rapidly as it spreads, so that there may be rather a picture of defect than of obvious tumour, and it is only in the later stages, when the orbits and accessory cavities have been invaded, that marked compression symptoms and invasion appearances are found. In the later history of cases headache increases in intensity, although it is sometimes intermittent in character. The nose becomes widened: the growth not infrequently extends on to the face, generally at the corner of the orbit; the orbits are often invaded, causing proptosis of the eyeballs. It may spread to the naso-pharynx, surrounding the Eustachian tube, causing deafness and earache: the speech becomes nasal, there is pain on swallowing, loss of taste, of appetite, and of strength. Extension through the cranial bones into the interior of the skull is much commoner than with sarcoma; this generally leads to death from meningitis or, more rarely, from brain abscess; otherwise death may simply occur through cachexia.

Metastases, according to all writers, are very rare, even in the lymphatic glands of the neck. Polyák⁷ records one case with general metastasis, but this is quite exceptional.

The following case, recently coming under our observation, seems of sufficient interest to report in detail:—The patient, a married woman, aged 43, was admitted to Leith Hospital on 2nd February 1910. She was the mother of eleven children, of whom seven were living; four had died in infancy. There was no history or signs of syphilis. Four years previously she had had a paralytic shock (after a confinement), affecting the right arm. The paralysis slowly passed off, but ever since there had been slight loss of power in the right hand and definite weakness in vision in both eyes (patient unable to read or sew). Further, her memory had been greatly impaired.

Eight months previous to admission, viz. in June 1909, she began to suffer from headache and vomiting. Both of these symptoms had persisted, with short periods of intermission, since that date. The headache was frontal, constant, severe, and nearly always on the left side. The vomiting was of typical cerebral type.

In September 1909 a watery nasal discharge appeared. On 27th October 1909 she was admitted to the Hospice with the above symptoms, and, in addition, marked ptosis and proptosis of the left eye and some numbness of the left cheek. While there, she was examined by Dr. Sym, who found no perception of light in the left eye, no reaction of the pupil, and no movement of the globe in any direction. On the right side vision was very greatly impaired and the pupil reaction very feeble. Under iodide of potash the pain disappeared, but no other improvement occurred.

During the patient's stay in hospital the pulse and temperature remained constantly subnormal, and the bowels only acted with medicine. The case notes, kindly placed at our disposal by Dr. Elsie Inglis, further record that no prominence of the cheeks was present on either side, and that, beyond a slight disability in the finer movements of the fingers of the right hand, no motor or sensory paralysis of the extremities was present. The reflexes were normal and the general intelligence good. A diagnosis of inoperable cerebral tumour with extension to the nasal sinuses was made. When discharged from the Hospice on 24th November 1909 the patient had become completely blind, and some ptosis of the right eye had appeared.

Between this date and her admission to Leith Hospital no very definite information as to the patient's condition was obtainable, but about the middle of January 1910 the nasal discharge appears to have become purulent, and a similar discharge was reported to have occurred from both ears.

When admitted to Leith Hospital on 2nd February 1910 she was practically in a dying condition. The accompanying photograph (Fig. 1) shows the extreme deformity of the face. Marked proptosis and ptosis of the *right* eye were now present, although not so pronounced as on the left side. The eyelids on both sides were also oedematous and discoloured, and there was some fulness of the cheeks, producing a false impression of broadening of the bridge of the nose. The patient was conscious but extremely lethargic, and lay with the mouth constantly open. The posterior



Fig. 1.—Photograph of patient taken shortly before operation.



Fig. 2.—Coronal section through skull. Shows growth completely filling up the ethmoid cells, complete invasion of the left orbit and partial (upper and inner parts) invasion of the right, great thickening of the nasal septum, downward bulging of the hard palate, thickening of the left inferior turbinal and encroachment on the left maxillary antrum. The paler parts in the growth are necrotic areas.

nares were somewhat blocked, and the palate bulged considerably downwards into the oral cavity. A copious purulent discharge flowed from the nostrils. On the few occasions on which the patient spoke the words were pronounced in a somewhat thick and slurring fashion, but there was no evidence on either side of paralysis of the facial or hypoglossal nerves. Owing to her condition it was impossible to ascertain whether the special senses of taste and smell were present. For the same reason it was difficult to determine if the sensory portions of the fifth nerves were involved. She could, however, use the muscles of mastication, and, as before, no paralysis of the limbs was present. Hearing was unimpaired. The pulse and temperature were still somewhat subnormal. Vomiting and pain were now not marked. Lumbar puncture gave no evidence of increased tension. The fluid withdrawn was slightly turbid, and contained a few diplococci but no cells. Dr. Logan Turner kindly saw the patient, and was strongly of opinion that the purulent condition of the sinuses was secondary to a tumour of the base of the skull.* Although the case was clearly beyond the stage of surgical intervention (as far as the tumour was concerned), it was thought worth while to drain the frontal sinuses. This was accordingly done on 4th February. The pus on examination showed the presence of numerous diplococci, but the organisms obtained on culture appeared to be diphtheroid bacilli. Death occurred five days later.

Post-mortem Examination.—Permission was only given for examination of the head. An operation wound opening into the right frontal sinus was present. On opening the cranial cavity a growth was found invading the frontal lobes from the floor of the skull; the growth had to be cut through to remove the brain. There was no meningitis. On removing the brain the tumour was seen to involve the anterior and middle fossæ; where the natural surface was preserved, it presented a rounded nodular appearance, the nodules varying in size from that of a pin's head to that of a pea. There was an opening from the interior of the skull into the left frontal sinus, due to the extension of the tumour through its posterior wall. The invasion and destruction of the floor of the skull extended over an area $1\frac{1}{2}$ ins. in width across the cribriform plate, increasing to 3 ins. at the anterior part of the middle fossa; the area involved was about

* At this time no very definite information regarding the patient's previous history was available.

the same on each side. The sphenoidal fissures and optic foramina were filled up by the growth, the optic nerves being surrounded by it almost immediately beyond the chiasma. The pituitary body was also surrounded by it, its fossa invaded, the clinoid processes destroyed, while the basi-sphenoid bulged into the cranial cavity. The growth did not extend so far back as the internal auditory meatus nor into the inner or middle ear on either side.

The tumour growth indented the under surface of both frontal lobes, and had also commenced to invade the brain substance. This invasion was more extensive on the left side than on the right, extending upwards into the brain for a distance of about 1 in. Both olfactory bulbs were destroyed. There was no appearance of softening or other change visible to the naked eye in the left ascending frontal convolution to account for the old paralysis of the right arm. Lower parts of the motor tract were not examined.

The tumour was further examined by freezing the parts and making a series of coronal sections, so as best to show the extent of its spread. The general naked-eye appearance was much the same all over, viz. white or yellowish-white masses varying in size from mere specks to areas half an inch across, and surrounded by a somewhat gelatinous-looking fibrous stroma. (Microscopically these areas were found to be masses of epithelial cells, becoming necrotic in the centre.) The largest necrotic areas were in the region of the ethmoid cells and upper part of the nasal septum, this part indeed being one soft pulpy mass, kept together by the subdividing fibrous septa. The left side was more extensively involved than the right. The ethmoidal cells were completely filled up and the floor of the skull over them entirely destroyed; laterally, the growth extended more widely into both orbital cavities, the left being entirely filled up, the right only partially. The bone between the left orbit and left maxillary antrum was destroyed by tumour growth, which bulged into the antrum from the roof and also from the inner wall, which was about a quarter of an inch thick. The outer wall and floor were invaded to a slight extent. The left inferior turbinate was fully a quarter of an inch thick, and studded with tumour nodules throughout its whole length. The middle and upper turbinates were not much affected. The nasal septum was considerably pushed over to the right, and greatly thickened, being an inch wide at its upper part (where the tissues were very soft and necrotic) and half an



Fig. 3.—Coronal section through skull, posteriorly to section figured in Fig. 2. Shows especially the extension upwards through the floor of the cranial cavity.

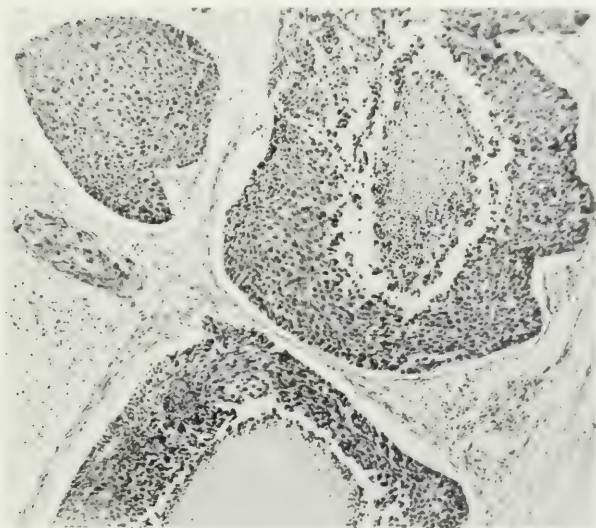


Fig. 4.—Three masses of tumour cells from the left inferior turbinal. The cells are small rounded undifferentiated basal cells, the nucleus rich in chromatin and with very little surrounding cytoplasm. One nodule shows commencing central necrosis, another shows complete central necrosis.

inch wide at its base. The invasion extended into the hard palate, which formed a low dome-shaped projection into the mouth. The nasal cavities were intact on both sides, although the lateral walls and thickened septum were in close contact above the level of the inferior turbinates. On the right side the antrum of Highmore was scarcely encroached upon, although a few nodules could be seen bulging from its inner wall. The inferior turbinate was not affected; the upper one, however, and the posterior part of the middle turbinate showed a slight invasion by tumour nodules.

Further back the wide destruction of the base of the skull could be seen and the extension of the growth into the middle fossa. The uppermost parts of the olfactory clefts were obliterated, as also was the left sphenoidal sinus. The cavity of the right sphenoidal sinus was not materially encroached upon, although its walls were everywhere thickened and invaded by the tumour. The tissues at the choanae were thickened and haemorrhagic. The soft palate was completely free from disease. No secondary growths in lymphatic glands were found in the retropharyngeal region, the side of the neck, or below the chin.

Microscopical Examination.—With the exception of one part, the choanae, the structure throughout is very uniform, viz. fibrous or fibro-cellular septa enclosing masses or nodules of cells. These nodules, whenever they attain any size, tend to become necrotic and break down in the centre, forming the cream-coloured dots and masses seen on naked-eye examination. The nature of the cells forming these nodules is not immediately obvious, as many of them have no evident epithelial characters, being simply small undifferentiated or embryonal cells, usually rounded, but sometimes spindle-shaped or irregular, with a nucleus rich in chromatin and a relatively small amount of surrounding protoplasm.

Here and there, however, are masses which give the clue to their real nature; these may be found in almost any of the affected parts, but are specially well marked in the lower part of the nasal septum. In these the cells at the periphery of the nodules are columnar in character, towards the centre they become just as distinctly squamous, and show well-marked protoplasmic cell bridges or "prickles." With van Gieson's stain they take on a yellowish colour, indicating commencing keratinisation. No definite "epithelial pearls" or "cell-nests" are to be seen, but many cells arranged in whorls suggesting their formation.

In other places, particularly in the brain, the cells appear as large squamous cells with less deeply-staining nuclei, and suggest an endothelial origin rather than an epithelial one, with which the whorl arrangement is not inconsistent.

The periphery of the cell masses is, as a rule, sharply defined, but occasionally finger-like projections of cells may be seen branching off into surrounding tissue. The thickness of the masses varies from about five to thirty cells, then those in the centre commence to break down. The necrotic edge varies in character; sometimes it is very sharp, the eye passing immediately from healthy cells to completely necrotic material, the transition indeed being so sharp as to suggest rather a cyst formation; in other parts the transition is gradual, intervening zones being encountered of faintly-staining cells, cells with shadowy outlines, and deeper staining dots representing the remains of nuclei, until, finally, a region of completely non-staining detritus is reached.

In the cell masses there is no intercellular stroma. The fibrous tissue between the masses is on the whole loose, faintly cellular, and not very vascular. The spread of the tumour seems to be by direct invasion, there being no evidence of spread by lymphatics.

At the choanae the epithelial cells are not grouped in such close cell masses; they have spread more diffusely through the tissues, and have also invaded the blood-vessels, which probably accounts for the hæmorrhagic condition of the structures in this situation.

Summary—Carcinoma Basocellulare Solidum.—All varieties of carcinoma occur in the nose. Kümmel states that pure types of cylindrical cell carcinoma and squamous cell carcinoma (epithelioma) are about equally common; in those starting near the anterior part of the nose naturally the squamous cell form predominates. The majority of cases, however, have no well-marked cell-form, and may be classed as "carcinoma simplex." Cases starting from the deeper parts almost always show well-marked epithelial metaplasia—a feature which, however, is not confined to neoplasm of the nose, as it is commonly seen in ozæna and other chronic inflammatory affections. Citelli and Calamida classify nasal carcinomata as—(1) Pure cylindrical-celled; (2) pure squamous-celled, often with cornification; (3) mixed-celled with squamous cells predominating, but with traces of the normal cylindrical cells. This type is the commonest. Trantmann and Gebhart also note the frequency of metaplasia, the occurrence of

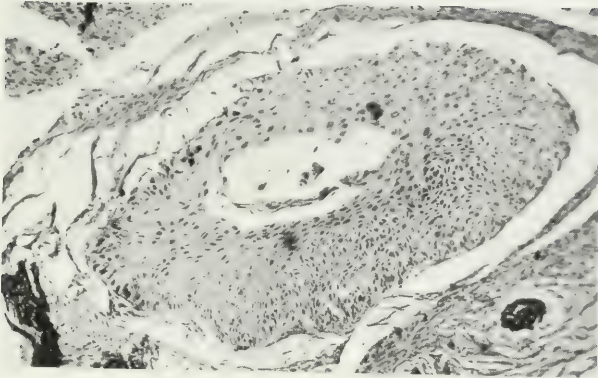


Fig. 5. Nodule from mesial septum of nose. Cells at periphery chiefly columnar in type, in centre (part fallen out in cutting the section) they are squamous and partly keratinised, midway can be seen some whorls of cells, and with a higher magnification many of the cells show prickles.

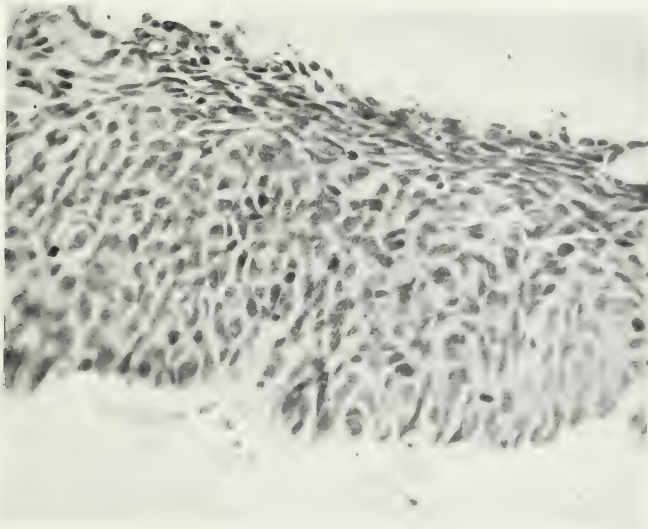


Fig. 6.—From brain. The cells at the lower part of the figure are at the periphery of a tumour nodule invading brain substance. Many are distinctly columnar. At the top they are squamous and there is immediate transition to the central necrotic portion of the nodule.

squamous cells, although the growth is arising from cylindrical-celled epithelium. They also remark that this may be found in other chronic affections. Donogány and von Lénárt, to whose paper we are specially indebted, are of opinion that the most scientific division of nasal carcinomata is on a basis of their histogenesis. They classify them as—(1) squamous-celled, including probably the majority of cases; (2) cylindrical-celled, often ciliated; a few (3) basal-celled—these are composed of non-differentiated cells, rich in chromatin and embryonic in character. They may form solid columns or masses of cells, or have an adenoid or cystic arrangement. The character of the cells also speaks to the starting-point; squamous or prickly cells indicate that the growth has commenced near the anterior nares, or that metaplasia is occurring; cylindrical cells point to an origin from deeper parts—either from surface or from glandular epithelium; while basal cells suggest the basal epithelium as the starting-point. These authors report six cases of basal-cell cancer, the first recorded from the nose, but probably others have been described as cases of medullary or of adeno-carcinoma. V. Navratil⁸ has since shown a patient, of 32 years of age, operated on for basal-celled carcinoma affecting the lower part of the septum, and Katz⁹ has recorded a case in which the inferior turbinate and posterior part of the nose were affected. He remarks on the rarity of endo-nasal carcinoma as in all parts rich in adenoid tissue, and notes the fact that growth is expansive rather than infiltrative. According to Krompecher¹⁰ basal-cell tumours grow in most cases from parts covered with squamous epithelium, or from the basal-cell layers of those glands which open on to a squamous-cell-covered surface, although the ducts of those glands may be normally lined with cylindrical epithelium.

The basal-cell layer of the cylindrical-cell-covered part of the nose is continuous with that of the squamous-cell-covered part, and hence with that of the skin, but the further development of the cells leads in the squamous-cell-covered area to prickly cells, in the deeper parts of the nose to cylindrical epithelium, and in the glands to glandular epithelium. Under the conditions of tumour growth the cells multiply, but retain, as a rule, their undifferentiated embryonal characters; only in places and in irregular fashion they may become squamous, cylindrical, or glandular.

In sharp contradistinction to Ribbert's views, Krompecher is of opinion that basal-cell cancers often have a multiple origin. Our

case corresponds exactly in type with some of those described by Donogány and von Lénárt as cases of *carcinoma basocellulare solidum*—masses of cells of embryonal type, with marked regressive necrotic changes, but also with considerable polymorphism or metaplasia.

As regards the site of origin in our case it is impossible to be dogmatic, but considering the great thickening of the upper part of the septum, the complete filling up of the ethmoid cells and extension in the floor of the skull, and the considerably greater spread on the left side, it seems most probable that the growth has started on the left side near the roof of the nose or in the ethmoidal cells. There does not seem to be any reason to predicate multiple sources of origin.

The growth has obviously not been one of great malignancy.

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A LOCAL EPIDEMIC OF ACUTE POLIOMYELITIS.*

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and

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Introductory—The Harvieston Epidemic—(a) *Record of Cases*; (b) *Observations Relating to Symptomatology*; (c) *Observations Relating to Contagion and Incubation Period*; (d) *Observations Relating to Etiology*—Prevalence of Poliomyelitis during the Autumn of 1910—Poliomyelitis and Epidemic Cerebro-spinal Meningitis. Is there a Possible Relationship?

INTRODUCTORY.

No disease has occupied such a prominent place in neurological literature during the past two or three years as has acute anterior poliomyelitis. The reason is to be found in the numerous epidemics which have recently occurred in various parts of the world. It is true that the disease appears to have been met with in "epidemic" form in Scandinavia for more than two decades, but in other parts of Europe and in the United States epidemics were almost unknown prior to the commencement of the present century.

We propose in this paper, *firstly*, to describe a localised "epidemic" of acute anterior poliomyelitis which has occurred recently in the practice of one of us (D. W. C.), and, *secondly*, to bring forward evidence which seems to justify the assertion that the disease has been more prevalent than usual in many parts of the country during the autumn of 1910.

The "epidemic" here recorded is, we venture to think, of very exceptional interest and importance from the suggestive data it affords in relation to the incubation period of the disease.

THE HARVIESTON EPIDEMIC.

The five cases reported in this paper all occurred in a farmstead consisting of four houses situated on a private estate some distance from the main thoroughfare and two miles from the town of Tillicoultry (population 3600) in the county of Clackmannanshire.

The four houses may be conveniently designated A, B, C, and D. House A is occupied by the factor or land steward, the three adjacent cottages by farm employees and their families.

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The A family consists of 2 children (A. A., aged 5, and B. A., aged 2½).				
"	B	"	4	" (A. B., aged 7½; B. B., aged 5½; C. B., aged 4; and D. B., aged 7 months).
"	C	"	4	" (all above 8 years of age).
"	D	"	2	" (aged 2 years and a few months respectively).

Five of the children in these four houses were attacked—A. A., B. A., A. B., B. B., and D. B.

(a) *Record of Cases*.—The following is a brief record of the history and symptoms of the five cases in the order in which they were taken ill:—

CASE I.—B. B., aged 5 years and 6 months, came home from school on the 12th and 13th of September complaining of headache which he referred to the forehead. He slept well each night, but on the 14th, as he still complained of headache and was feverish, his mother kept him in bed. During the day his mother states that he complained of pain in the back of the neck and in the legs, while she noticed that he "held his head back." He was drowsy and heavy all day. For the next 48 hours he was feverish and restless, but on the 16th the fever had quite disappeared. The bowels were constipated. There was no vomiting. On the 19th, when he was allowed to get up, he complained that his legs felt very tired, and it was observed that his head, which he seemed to have difficulty in holding up, was inclined to the right side. In a few days he appeared to be quite well, and returned to school on 25th September. He walked to school and back, a distance of two miles each way.

CASE II.—A. B., aged 7 years and 4 months, a sister of the last patient, complained of headache on the morning of 16th September. She went to school as usual that day but when she returned in the afternoon she said that the pain in her head was very severe and that the legs felt so tired and sore that she had had difficulty in getting home. She was feverish and did not sleep that night. The fever continued for two or three days. Her mother states that her neck was stiff, and she held it far back "just like Archie" (B. B.). The pain in the legs was referred chiefly to the right hip and to both knees. Pain on passive movement of the limbs was such a striking feature that the condition was at first suggestive of acute rheumatism notwithstanding the absence of any articular swelling. She did not vomit. The bowels were somewhat constipated. The pain in the legs was severe for a week, and it was only on the third or fourth day of her illness that weakness of the lower limbs, more particularly the right, was observed. For two or three days she seems to have had a little difficulty in passing water. Improvement has been slow.

When examined on 31st October it was found that there was complete paralysis of the right lower limb, with the exception of a slight degree of movement of flexion and adduction at the right hip. On the left side all the movements were fairly satisfactorily carried out against resistance, although flexion at the hip was relatively weaker than the others. There was at this time no observable weakness of the trunk muscles. The upper limbs were in all respects normal, as were the cranial nerves. The paralysed and paretic muscles showed no wasting as compared with those of the left lower limb, unless in the case of the thigh, which was very slightly smaller than its fellow. The affected muscles were quite flaccid. The foot on the right side could be brought to within a few inches of the face when the extended leg was flexed on the trunk, while that on the left side could only be brought to about the vertical. The muscles of both lower limbs were slightly hyperaesthetic when handled. There was otherwise no objective disturbance of sensation. The knee- and ankle-jerks were absent on the right side, while those on the left side were present. The right plantar reflex was not elicited, that on the left side was of the flexor type.

CASE III.—D. B., aged 7 months, a brother of the children whose cases are above referred to, was taken ill on Sunday, 18th September. On that day he was feverish and fretful, and vomited. The fever lasted for three days. His mother said "his head went back too: it affected them all the same." She further stated that "with Willie (D. B.) it was all in the head." On 20th September a convergent strabismus was noted and has persisted since. No weakness of the arms or legs was detected although specially looked for. He seemed to have quite recovered in a few days except for the squint. On 31st October, when examined by the writers together, apart from a slight internal strabismus of the left eye there was no evidence of paralysis—indeed he appeared to be perfectly well.

CASE IV.—B. A., aged 2½, complained on Tuesday, 20th September, of headache, and was feverish (temperature 101°). On the 21st, 22nd, and 23rd, although he seemed "out of sorts" and had no appetite, the temperature was normal and he was not confined to bed. On the 24th, however, he again complained of headache and the same afternoon of a tired feeling in his legs, while the same day it was noted that the right side of his face was paralysed. During the 25th he was very drowsy and could only be awakened with difficulty. He was, his mother says, unable to lift his head from the pillow to take nourishment. That night he was very restless and "wandering" (delirious), and he vomited more than once. The temperature on the 26th rose to 104° but fell to normal in a day or two. The bowels were some-

what constipated throughout. There was no difficulty with micturition. The facial paralysis rapidly improved, and on 31st October had quite disappeared. The patient was then running about quite well.

CASE V.—A. A., aged 5, a sister of the last patient, was taken ill on 24th September with headache and a tired feeling in the legs. The temperature was taken and found to be 99·6°. On the 26th and 27th she was running about seemingly quite well. The following day (the 28th) she went for a walk, and on her return her mother says that her legs were trembling and her temperature was found to be 101°. On the 28th she vomited several times, as she did again on the 30th. From her mother's description there would seem to have been some head retraction, although she did not complain of pain in the neck. The right arm was found to be quite limp on 30th September, and her temperature on this day rose to 103°. On 1st October the legs and right arm were painful. Two days later it was found that both legs were paralysed. Constipation was a prominent feature, and for ten days she had some loss of control over the bladder. The condition on 31st October was as follows:—Both lower limbs were completely paralysed save for slight movement of the toes on the right side, a movement which had only been regained during the past two or three days. There had been pronounced improvement in the right arm, for although all the movements were a little feeble as compared with those of its fellow, abduction at the shoulder was the only movement which was found to be notably defective. She resented passive movement because of the pain which it produced. More especially was this the case in the ham-strings when an attempt was made to extend the legs on the trunk. The muscles were flaccid and there is some wasting. No objective disturbance of sensation was detected. The plantar reflexes and tendon jerks of the lower extremities were absent. The cranial nerves were normal.

(b) *Symptomatology*.—The character of the symptoms met with in these five cases calls for comment. Two of the cases (A. A. and A. B.) were typical examples of acute anterior poliomyelitis. The remaining three cases were, on the other hand, atypical in so far as B. B. recovered without developing any definite paralytic symptoms, B. A. presented only a temporary facial paralysis, while in the case of D. B. a squint was the only paralytic manifestation. The true nature of the affection might well have escaped recognition had these cases occurred as isolated instances. The circumstance that the five patients were taken ill within a few days of one another, together with the similar symptoms which characterised the onset, makes it certain that all the cases were due to the same causal agent. It may be noted in passing that

one of the striking features of recent epidemics has been the comparative frequency of cerebral palsies and of complete recoveries. Thus in the report of the special committee appointed to investigate the New York epidemic in 1907, twenty-seven cases are referred to in which the face was paralysed and twenty-six in which there was strabismus, while complete disappearance of the paralysis was noted in 5·3 per cent. of the collected cases. Again, it should be mentioned that the statistics collected by the New York committee do not include abortive cases to which Wickman has especially drawn attention, and under which category the three exceptional cases above described (B. A., B. B., and D. B.) should probably be placed.

The frequency of pain in the neck, nuchal rigidity and head retraction, of severe headache, and of vomiting account for the by no means uncommon erroneous diagnosis of meningitis in the early days of an attack. The pain and tenderness in the limbs, as exemplified in the case of A. B., may be so severe as to suggest acute rheumatism in the first instance.

An interesting feature in two of our cases (A. A. and B. A.) was the circumstance that the day following the initial rise the temperature fell to the normal, and remained normal for two or three days, the patients in each instance feeling so much better that they were permitted to get up and go about, until the temperature rose again two or three days later.

(c) *Contagion and the Incubation Period.*—A study of the dates of onset of the disease is most interesting in this connection. The children, it will be seen, were taken ill in the following order, viz.:—B. B. (12th September), A. B. (16th September), D. B. (18th September), B. A. (20th September), and A. A. (24th September). Thus it will be noticed that the B.'s were attacked before the A.'s, and that an interval of from two to four days elapsed between the onset of the disease in each instance. This circumstance certainly gives strong support to the view that the infection was directly communicated from one patient to another. Assuming that the disease is only contagious after the appearance of the first symptom, the data relating to the incubation period are as follows:—

1. A. B., B. B., and C. B. slept not only in the same room but in the same bed. A. B. was taken ill on 16th September, *four days* after B. B. It certainly seems very probable that A. B. was infected by B. B.

2. D. B., who slept in a cradle in the same room as his father

and mother, first manifested symptoms on 18th September. Was he possibly infected by B. B. or A. B.? It is interesting to note that on and after 14th September, *four days* before D. B. was taken ill, B. B. slept in the same room as his mother and D. B. From 16th September onwards A. B., B. B., D. B., and Mrs. B. slept in one room, while C. B. and Mr. B. slept in another.

3. Since A. A. and B. A. slept in the same room, and since B. A. was attacked on 20th September, and A. A. on 24th September, it seems highly probable that A. A. was infected by B. A. Here, again, it is of great interest to note that an interval of *four days* elapsed between the first manifestation of the disease in these two cases.

4. Whence came the infection in the case of B. A.? The A.'s, it will be noted, were taken ill after the B.'s. If, as the evidence certainly seems to forcibly suggest, A. B. was infected by B. B., D. B. either by B. B. or A. B., and A. A. by B. A., it seems only reasonable to conclude, having regard to the time interval, that B. A. was in all likelihood infected by the B. family. Very positive statements were made by both Mrs. A. and Mrs. B. to the effect that neither of the A. children were in the B.'s house and none of the B. children in the A.'s house after B. B. was taken ill, *i.e.* after 12th September.

Is there any reason for supposing that the infection may have been carried by a third person? Mrs. A. states that on 16th September, and again on the 18th and 19th, she visited the B.'s house, and that on the two dates last mentioned she remained on each occasion in the house for several hours assisting to nurse the baby (D. B.). This circumstance, when taken in conjunction with the negative facts above referred to, certainly suggests the possibility that she may have carried the infection. If this is so, it is probable that here also the incubation period was four days or less.

Finally, these observations certainly suggest that the incubation period of the disease, in the case of this local epidemic, was probably four days or less.

The scarcity of observations bearing on this question is indicated by the committee appointed to investigate the New York epidemic of 1907. After reviewing the literature they conclude by stating that:—"The data on the probable average incubation period are too meagre to permit of definite conclusions, though the evidence indicates an average incubation period of less than ten days." The paucity of data accumulated by the com-

mittee in relation to the incubation period, when it is remembered that their conclusions are based on a total of 752 cases, is certainly striking. We may quote their statement *verbatim* in this relation. "The following are our own data concerning this point. Case 173 had been in Vermont until ten days before the onset, and Case 123 had also been home from the country for ten days. If the infection resulted in New York it shows an incubation period of less than ten days. Case 30, living at Dykeman's, had been in New York City one week before. This indicates an incubation period of at least a week, provided infection was contracted there. Case 244 had been home five days when attacked. If infection resulted at home it indicates an incubation period of five days or less. On the other hand, Case 214 had been at Old Forge one month when attacked. If this patient became infected before leaving New York it would indicate an extremely long incubation. In one of the two instances where three cases occurred in one family the onset of the first was 25th August, of the second, 29th August (night), and of the third, 30th August (noon). It is, of course, impossible to determine whether the subsequent cases were infected from the first case. If this was so it would indicate an incubation period of four or five days. In the other instance the first case was a boy, 8 years old, who died on the third day of disease of respiratory paralysis. The next case was a brother, 4 years old, the first symptoms developing on the day the first case died. One week after onset of second case a sister, aged 6 years, was stricken with the disease. Here, again, it is impossible to say whether the later cases were infected from the earlier ones. If this should be so it would indicate an incubation period of three days or less to not over a week."

Wickman's conclusions are referred to in the report of the New York committee as follows:—"From a study of the time elapsing between the first and subsequent cases in those instances where two or more cases occurred in the same family or same house, Wickman concludes that the period of incubation of poliomyelitis is usually from one to four days."

Holt and Bartlett have collected reports of thirty-five epidemics of poliomyelitis prior to the year 1907. In a summary of conclusions they state, "After carefully considering all the evidence brought together in this paper, we cannot resist the conclusion that the disease is communicable, although only to a very slight degree, one of the most striking facts being the development of the second case within ten days after possible exposure."

(d) *Etiology*.—It is worthy of note that all the children whose cases we have reported were of a robust type, that all were in good health, and that the onset was in no instance associated with coryza or diarrhoea. No abnormal mortality was at the time observed among the poultry or farm stock. Since climatic influences have been regarded as of etiological moment, it may be mentioned that the rainfall in this part of the country was much above the average during the last fortnight of August and first few days of September, while after this date the weather was fine, but not abnormally hot.

The original source of infection is a problem in relation to which we are not in a position to offer an opinion. Three additional cases of acute anterior poliomyelitis occurred about the same time in the town of Tillicoultry, the dates of onset being 15th and 20th September and 7th October. Two of these cases occurred in the practice of Dr. Johnstone, by whose kind permission we were enabled to examine them. The two earlier cases occurred in children aged 7 months and 2 years respectively. In neither instance was a brother or sister attending school. We can trace absolutely no connection between these three cases and those here reported. Further, we have good grounds for believing that these three cases are the only cases which have been observed in Tillicoultry for some years back. Again, neither the A.'s nor B.'s have, so far as their parents are aware, been in contact with anyone suffering from the disease or, as far as can be ascertained, with any possible carrier of infection. There can be no question, however, that cases of acute anterior poliomyelitis have been more numerous than usual in many parts of the country during the past autumn.

PREVALENCE OF ACUTE ANTERIOR POLIOMYELITIS DURING THE AUTUMN OF 1910.

It is generally admitted that acute anterior poliomyelitis is more commonly met with during the late summer and autumn months than at other times of the year, and that in some years these cases are more plentiful than in others. Reliable data bearing on this question are for obvious reasons admittedly difficult to obtain. We have, however, been able to collect some facts and opinions which seem to clearly indicate that in certain parts of the country at any rate the disease has been more prevalent during the past autumn than for several years past. In

recording the results of our inquiries we welcome this opportunity of thanking those who have helped us either by placing data at our disposal or by a general expression of opinion. There can be no doubt that cases of poliomyelitis have been more numerous than usual this year in Edinburgh and its neighbourhood. Through the kindness of the physicians to the Edinburgh Hospital for Sick Children (Drs. H. M. Dunlop, John Thomson, and J. S. Fowler) we are enabled to cite figures as to the number of cases of acute poliomyelitis treated in their wards during the late summer and autumn months (July to November) for the past five years:—

1906.	1907.	1908.	1909.	1910.
18	10	8	3	23

Our thanks are also due to Dr. Dingwall Fordyce, who has kindly placed at our disposal data as to the number of cases seen in the Out-patient Department of the Hospital during the corresponding period.

1906.	1907.	1908.	1909.	1910.
8	7	7	3	14

We are inclined to think, from conversation with physicians who come in contact with cases of poliomyelitis in consulting practice, that these comparative figures perhaps underrate the relative increase of cases of this disease observed in Edinburgh and its neighbourhood during the past year. Three cases of acute poliomyelitis in adults have been seen by one of us (E. B.) within the last three months.

Dr. Leonard Findlay has very kindly furnished us with statistics from the Medical Dispensary Department attached to the Glasgow Royal Hospital for Sick Children for the months of July, August, September, and October from 1906 to 1910 inclusive:—

1906.	1907.	1908.	1909.	1910.
22	16	14	23	38

It would appear from these figures that in Glasgow also cases of poliomyelitis were last autumn more numerous than usual.

Professor Stalker of Dundee writes:—"Dr. Kerr shewed a case in a child of 17 months, in which the face was involved, at our clinical club last night. Dr. Rogers, who has the children's ward here, said that he had three cases of infantile paralysis in the ward at present, and Dr. Fraser, the Infirmary superintendent, said that there was not a single case all last year. The children's

ward has only something like ten beds for medical cases in all, so that about a third of the cases at present are recent cases of infantile paralysis."

On the other hand, Dr. Ashley Mackintosh of Aberdeen writes:—"It has certainly not been more common here; I have never come across anything like an epidemic."

Although no attempt has been made to extend our inquiry to the smaller towns or country districts in Scotland, our impression is that the disease has been at least as prevalent in the small districts as in the cities. Half the cases included under the admissions to the Edinburgh Royal Hospital for Sick Children resided in the surrounding country and neighbouring towns. Dr. Reid of Forth and Dr. Dickson of Queensferry incidentally informed us that they had recently met with four and three cases respectively, not having seen another case for some years, while Dr. Muir of Bellshill, Lanarkshire, in a letter to Dr. Byrom Bramwell, mentions that he saw five cases in the months of June and July 1910.

Dr. David Drummond of Newcastle-on-Tyne writes:—"There are no data upon which to base a relative statement. You may, however, take it from me that there has been something approaching an epidemic in the north of England, and that it is not limited to the Newcastle district. I have been struck by the increase in these cases during the last twelve months." In a subsequent letter Dr. Drummond refers to a local epidemic in Northumberland. He writes:—"Dr. Murray of Haydon Bridge spoke to me to-day (2nd December) about a small outbreak of anterior poliomyelitis in his neighbourhood. It seems that at one very small village, consisting of six or eight houses, he has had three cases within the last eight weeks."

Dr. Bruce Low informs us that, "At the Sunderland Infirmary, in a children's ward of sixteen beds, there are at present five recent cases of acute poliomyelitis, and that an unusual number of cases are waiting for admission."

Dr. Donald of Carlisle writes:—"We have had a small epidemic of acute poliomyelitis here this autumn."

Dr. Jacob has very kindly forwarded us the figures from the Out-patient Department of the Nottingham General Hospital for the months of July, August, September, and October. They are as follows:—

1906.	1907.	1908.	1909.	1910.
25	21	38	26	48

Dr. Jacob informs us that there have been a large number of cases in Melton Mowbray and its immediate neighbourhood recently.

Dr. Stanley Barnes of Birmingham writes:—"It is rather curious that you should have written to me just now about poliomyelitis. We have had in this district a moderate-sized epidemic, of which you may have seen some note in the newspapers. This epidemic, which occurred chiefly in certain villages in Leicestershire, was diagnosed, as far as the newspapers were concerned, as cerebro-spinal fever. I saw none of the cases in Leicestershire, but I saw three who had had attacks of this disease there and who were sent to me within the next few weeks. They were all cases of acute poliomyelitis."

Dr. Michell Clarke of Bristol, in replying to our inquiries, writes:—"There have been a large number of cases of acute anterior poliomyelitis here."

Dr. Dyke Acland writes:—"I have a case under my care in St. Thomas's, which is one of eighteen cases occurring recently in a small village in Dorsetshire."

A prominent physician in Manchester writes:—"I have not noted any increase in the number of cases of acute anterior poliomyelitis in my own practice in Manchester (hospital and private), but I have heard that there have been more cases of this disease than usual in Manchester recently." Dr. Niven, the Public Officer of Health for Manchester, and Dr. Heywood have most kindly provided us with figures which, since they include cases of old standing, some of which may have paid repeated visits to the hospitals, are not of much value in relation to the present question.

Dr. W. B. Warrington of Liverpool writes:—"There seems an impression here that infantile paralysis has been more frequent this year, but we have not yet had anything like an epidemic." The registrar to the Royal Southern, at Dr. Charles Macalister's request, looked into the matter and writes:—"No case of acute anterior poliomyelitis has been admitted to the Hospital this year."

The data and opinions which we have received from London do not appear to indicate that acute poliomyelitis has been more frequent in the metropolis this year than in previous years. Dr. R. S. Frew, the Medical Registrar at the Great Ormond Street Hospital, has most kindly made out for us a list of cases admitted during the past eight years. From these figures

it would seem that the number of cases admitted this year is very much about the average. Dr. Frew points out that there are very obvious fallacies, the admissions depending upon the number of vacant beds, the frequency of other diseases at the time, the inclinations of the physicians who admit cases, and so on. No out-patient figures are available.

Dr. G. A. Sutherland, writing of the admissions to the Paddington Green Children's Hospital, says: "I find that only one case of acute anterior poliomyelitis has been admitted during the stated four months this year. As a matter of fact we rarely get acute cases into the Hospital."

Dr. F. E. Batten writes:—"I quite agree that poliomyelitis has been very prevalent this summer (1910), but I don't think it is more so than the summer of 1904. The summer of 1904 was cold and wet, and the mortality from specific fevers was low, and the diarrhoea mortality was very low."

Dr. Leonard Guthrie informs us that at the Maida Vale Hospital for Nervous Diseases during the months of July, August, and September, ten out-patients and two in-patients were treated in 1909, six out-patients and two in-patients in 1910. Dr. Guthrie writes:—"I have never seen anything supporting an epidemic, but agree that most cases occur in the hot months of the year."

Dr. S. A. K. Wilson, the Registrar to the National Hospital, points out that no information with a direct bearing on the point in question can be deduced from the available data.

From these observations we think we are justified in drawing these conclusions:—

(a) That acute poliomyelitis was more prevalent than usual in various parts of England and Scotland during the autumn of 1910.

(b) That there are grounds for believing that this increased frequency was as pronounced, if not more so, in the smaller towns and rural districts as in the cities.

(c) That in certain parts the disease has been met with in epidemic form.

EPIDEMIC POLIOMYELITIS AND MENINGOCOCCAL MENINGITIS.

IS THERE ANY POSSIBLE RELATIONSHIP?

Acute poliomyelitis and meningococcal cerebro-spinal meningitis resemble each other in that both occur in a sporadic and epidemic form, both tend to affect children, both are often ushered in by similar symptoms, while both appear to be only slightly

contagious. They differ notably in that poliomyelitis is a disease of late summer and autumn, cerebro-spinal fever of the winter months. Again, acute cerebro-spinal fever and posterior brain meningitis have been proved to be due to the meningococcus intracellularis, while poliomyelitis, though its cause still remains undiscovered, is certainly not due to this organism.

The recent occurrence of epidemics of these two diseases may be accounted for by coincidence. On the other hand, the occurrence of the unprecedented epidemic of cerebro-spinal meningitis in New York and other parts of America in 1904-5 and the widespread epidemic of poliomyelitis, hitherto unknown, in 1907 suggests the possibility of some more intimate association. It is interesting to note that in Edinburgh, Glasgow, and other parts of the country cerebro-spinal meningitis was met with in epidemic form in 1906-7, while in 1910 cases of acute poliomyelitis have been more numerous than usual. We know of no evidence, however, which demonstrates that cases of acute poliomyelitis have been especially numerous in localities where cerebro-spinal meningitis was more frequent, or that epidemics of the two diseases occurred concurrently in the same place and at the same time.

CLINICAL RECORDS.

UNUSUAL FORM OF DIVERTICULUM ILEI.

By J. W. STRUTHERS, F.R.C.S.,
Assistant-Surgeon, Royal Infirmary.

THE accompanying photographs show a form of diverticulum from the ileum which appears to be rare, as no record of a similar condition has been found in a search through a large number of papers on diverticula from the small intestine. The history of the symptoms to which the diverticulum gave rise is briefly as follows:—

Mrs. A. B., æt. 49, had suffered for about a year before her admission to the Royal Infirmary, Edinburgh, from repeated attacks of colicky pain in the epigastric region. The attacks at first came at intervals of a week or ten days, and were attended by vomiting but not with rise of temperature or jaundice. They came without obvious cause, lasted several hours, never more than one day. They gradually became more frequent till her admission to hospital. While under observation in a medical ward for some weeks several attacks were observed. The pain was always in the epigastric region, especially on the right side, and did not radiate in any characteristic direction. It was associated with some tenderness and rigidity in the right upper quadrant of the abdomen. It was thought that the patient was probably suffering from repeated attacks of biliary colic and she was transferred to the surgical side for operation.

The abdomen was opened through the right rectus muscle above the umbilicus, and the stomach, duodenum, gall-bladder, pancreas and right kidney were explored without any abnormality being detected. The cæcum and appendix were also palpated and appeared to be healthy. The abdomen was accordingly closed without any cause for the pain being found. Soon after her discharge from hospital the patient began to suffer from her former symptoms, and she was eventually readmitted in what at first appeared to be an attack of the usual kind. Examination showed, however, that the pain and tenderness were most marked below the umbilicus on the right side, instead of above, as in former attacks, while, in addition, the temperature rose to 101° F. and the pulse to 120. It soon became evident that she was suffering from peritonitis, but she would not consent to operation until her condition became very grave. When at length the abdomen was opened, this time below the umbilicus, an advanced general peritonitis was found. After a search the apparent cause was discovered in a

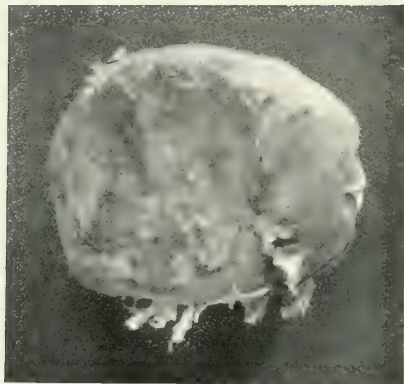


FIG. 1.
§ natural size.

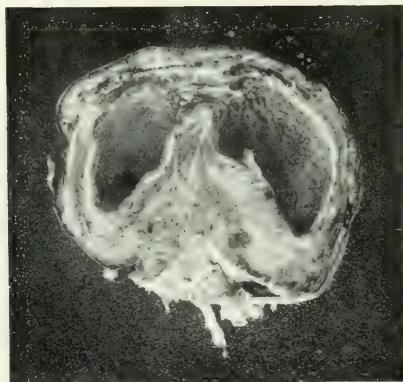


FIG. 2.

leakage from a rounded swelling (Fig. 1) attached by a broad base to the upper aspect of the mesentery 2 feet above the ileo-caecal valve and lying up against the small intestine. The swelling was felt to contain gas and fluid, and looked at first very like a piece of gut herniated through a hole in the mesentery. It was removed and the abdomen was drained after being thoroughly washed out. The patient died.

It was only on cutting the swelling across after fixing it in formalin that its true nature was apparent. Fig. 2 shows the cross-section, and a well-marked canal can be seen with a narrow constriction about the middle, lined by mucous membrane and with a very thick muscular coat. A minute canal hardly visible to the naked eye was found leading from one end of the main canal to communicate with the small intestine. The mucous membrane was acutely inflamed, and a small abscess had formed in the connective tissue at the base of the swelling which had burst into the peritoneal cavity and caused the fatal peritonitis. Microscopic examination of the main canal and the minute track leading from it showed a columnar epithelial lining with a very thick muscular coat disposed in two layers, longitudinal and circular. The condition was apparently due to the persistence of a Meckel's diverticulum which had become adherent to the mesentery and in which an imperfect attempt at obliteration had taken place, as shown by the narrowing at the middle of the main canal and the extreme narrowing of the proximal end of the diverticulum where it joined the small intestine. The repeated attacks of colicky pain were no doubt due to spasmodic contractions of the muscular wall of the diverticulum in expelling the secretion from the mucous lining, and probably these were set up when the cavity became full, while the final attack was associated with infection which spread to the walls of the diverticulum, where a small abscess formed and burst into the peritoneal cavity.

The writer is indebted to Mr. David Wallace for kindly giving him the opportunity of treating the patient in his ward on her return to the Infirmary after the first operation.

TWO CASES OF ACUTE DILATATION OF THE STOMACH FOLLOWING GASTRO-JEJUNOSTOMY.

By GEORGE ROBERTSON, L.R.C.P.&S.(EDIN.),
Surgeon, Dunfermline and West Fife Hospital.

I HAVE met with this condition on two occasions, and I should like, in a few lines, to express my views as to its cause.

It is well known that dilatation of the stomach occurs coupled with distension of the intestines in general septic peritonitis, but the post-operative dilatation to which I refer in this article is a dilatation with

no sign of peritonitis, and, instead of being associated with distended intestine, is really found with collapsed loops of small intestine.

The first case I encountered was fatal on the fifth day, in spite of all the recognised methods of treatment directed towards this complication. The second case was fatal on the seventh day after a second operation had been performed with a view to relieving the condition. On both occasions I found, in the first case post-mortem, and in the second case at the second operation, and, later, after death, a very distinct collapse of the small intestine, and I have no doubt as to the cause of the collapsed bowel and of the dilated stomach. In both cases it was due to marked obstruction at the site of the anastomosis, and was entirely due to imperfect technique.

The obstruction was brought about in this manner. After applying the first posterior continuous serous suture, the incision into the stomach and intestine was made too far away from that line of suture, certainly more than the usual quarter of an inch. Then, again, the continuous circular catgut suture, passing through all the coats of stomach and intestine, was passed through the walls of the viscera on the anterior aspect of the anastomosis at too great a distance from the cut edges of the openings.

The result of sutures so applied is not only a serious diminution of the size of the gastro-intestinal anastomosis, but, what is even more important, a reduction, to a much greater extent than one would suppose, of the calibre of the small intestine, thereby causing a very marked obstruction.

I may say that after I had removed, post-mortem, a large piece of the stomach and small intestine from my first case, I filled that part of the stomach with water and was surprised to see that the fluid barely trickled through the anastomosis into the bowel and out at the distal cut end of the jejunum.

That being so, one can quite understand how the case proved fatal. The obstruction simply resulted in regurgitation from the duodenum of large quantities of bile through the pylorus into the stomach, whose mucous membrane then poured out a large quantity of secretion, and the whole was vomited repeatedly and in large quantities, until the patient died from exhaustion.

I do not doubt that there is a form of post-operative dilatation of the stomach following abdominal operations, and due to some obscure nervous mechanism, possibly of a sympathetic nature, and I feel quite satisfied in my own mind that to relieve such a condition a well-performed gastro-jejunostomy is indicated. I cannot believe that dilatation of the stomach ever follows a properly performed gastro-jejunostomy. It would be against all rudimentary principles of surgical drainage to believe so.

I have performed on many occasions the operation of gastro-

jejunostomy, but since these two operative failures happened upon which I have based this article I have taken care to avoid narrowing the calibre of the jejunum to any great extent by encroaching too much upon its walls at the line of suture.

I do not think this precaution is sufficiently emphasised in the majority of text-books, and I believe that the large majority of cases of vicious circle, of post-operative dilatation of the stomach following gastro-jejunostomy, are avoidable.

MEDICAL EDUCATION IN SCOTLAND.

A CANDIDATE desirous of obtaining a legal qualification to practise medicine must conform to the Regulations of the General Medical Council, which require (1) that the candidate must first pass a preliminary examination; (2) must register as a medical student; (3) must study for at least five years at a school recognised by the General Medical Council; (4) must obtain a degree or diploma recognised by the Council; and (5) must enter his name on the official list of medical practitioners, the *Medical Register*. No person whose name does not appear on the *Medical Register* may legally sign certificates, give medical evidence in Court, or sue for fees.

Provided these Regulations are conformed to, the candidate has a wide choice of medical schools, and may proceed to take either a University degree or a diploma of the other licensing bodies. Those available in Scotland are as follows :—

Degrees.—The Scottish Universities confer the degrees of Bachelor of Medicine and Bachelor of Surgery (M.B., Ch.B.) on candidates who have attained the age of twenty-one. These degrees admit to the *Medical Register*. The higher degrees, Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), may be registered as additional qualifications.

Diplomas.—The Royal College of Physicians of Edinburgh, the Royal College of Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow co-operate in conducting Examinations for the *Triple Qualification* (L.R.C.P.E., L.R.C.S.E., L.R.F.P.S.G.), which admits to the *Medical Register*. Like the higher degrees of the Universities, the Fellowships and Licences of any of these corporations may be registered as additional qualifications.

Special degrees and diplomas are granted to qualified persons in the department of public health.

THE UNIVERSITIES.

PRELIMINARY EXAMINATION.—Each student must pass this examination before commencing medical study. At the matriculation office of each University, candidates can obtain schedules, which must be filled up and lodged not later than certain dates in March and September respectively. The fee for examination is 10s. 6d., and should be paid at the time of lodging the schedule. Candidates are examined on the following subjects :—

1. *English.*—A single three hours' paper will be set, containing an Essay, a Paraphrase, two questions on History, two in Geography, four on Grammar (including Correction of Sentences, Parsing, Analysis of Sentences, and Derivations), two of a literary and general kind. Eight answers will be required. The Essay, the Paraphrase, one answer in History, and one in Geography are compulsory.

2. *Latin.*—Translation, Parsing, Grammar, Prose Composition, and Sentences.

3. *Elementary Mathematics.*—(a) Arithmetic (fractions, proportion, percentage, square root, and simple interest); (b) Algebra (fractions, factors, square root, equations of the first degree, simultaneous equations of the first degree, quadratic equations and problems leading thereto); (c) Geometry (Euclid, Books I., II., and III., or their equivalents, with simple deductions).

(4) *Greek, French, German, or Italian.*

French or German.—Grammar, translation into English and into French or German, and short idiomatic sentences for translation from English.

Greek.—Grammar, translation into English, and of short sentences into Greek.

In the case of a candidate whose native language is not English, an examination in the native language of the candidate may be substituted for one

in either French or German, and an examination in any other classical language for one in Latin or Greek.

It is compulsory that the subjects be passed at not more than two examinations, but there is no restriction on the number of times the candidate may present himself for examination. A degree in Arts or Science in any University of the United Kingdom, and in any Colonial or Foreign University specially recognised; the Lower Grade Leaving Certificate of the Scottish Education Department, and certain other examinations, are accepted as equivalents for the preliminary examination. The preliminary examination conducted by the Educational Institute of Scotland is not accepted as an equivalent examination.

MATRICULATION.—Having passed the preliminary examination, the student must, within fifteen days after the commencement of the session, make the required entries in the Matriculation Album of the University, and pay the matriculation fee, which is one guinea for the whole year, half a guinea for the summer session alone. The student must matriculate each year of study.

REGISTRATION.—Within fifteen days after commencement of study, he must register as a medical student. He must be not less than sixteen years of age, must have passed the preliminary examination, and must produce to the Registrar (James Robertson, Esq., 54 George Square, Edinburgh) an application form duly filled up, showing that he has commenced medical study.

THE CARNEGIE TRUST.—This Trust is prepared to pay the class fees of students (who have passed the specified preliminary examination) for all classes, whether attended within the Universities or in any of the Extra-Mural Schools. The Trust is also prepared to pay the class fees for students proceeding to the Triple Qualification, provided that the applicant has passed the preliminary examination recognised by the Trust. It is also prepared to pay the fees for the various special classes given by many of the Lecturers upon advanced and non-compulsory subjects. Three qualifications are demanded: the applicant (1) must be over sixteen years of age; (2) must be of Scottish birth or extraction, or must have given two years' attendance after the age of fourteen at a school or institution under inspection of the Scottish Education Department; and (3) must be qualified by preliminary examination under the ordinances of the Scottish Universities Commission and the regulations of the Joint Board of Examiners, to attend the classes for which payment of fees has been claimed. Schedules of application for admission to the benefit of the Trust are obtainable by written application to the Secretary of the Trust, 14 Hanover Street, Edinburgh.

PROFESSIONAL EDUCATION AT THE UNIVERSITIES.

The rapid growth of medical science in recent years has been reflected by an increase in the amount of study required of the student. New classes have been added, and the problem of including these without lengthening the five years' curriculum has received much attention from medical educationalists.

EDINBURGH UNIVERSITY.

The University Court has passed a New Ordinance which comes into operation at the beginning of the Winter Session, 1911-12, and students who begin the study of medicine on or after that date must conform to its provisions.

Students who have commenced their studies previous to that date will have the option of continuing their curriculum under the former regulations or of changing to the New Regulations.

Under the New Regulations the following order of study is recommended:—

A.—For Students Beginning in Summer.

FIRST YEAR.

Summer—

Botany. Zoology.

Practical Botany	} On alternate days.	Practical Anatomy.
Practical Zoology		

*Examination in Botany and Zoology.**Winter—*

Practical Chemistry (twice weekly).	Anatomy.	Chemistry.
Physics (Mon., Tues., and Thurs.).	Practical Anatomy.	

Examination in Chemistry and Physics.

SECOND YEAR.

Summer—

Histology. Practical Anatomy.

Winter—

Physiology. Practical Physiology (twice weekly).

Practical Anatomy and Demonstrations.

Examination in Anatomy and Physiology.

THIRD YEAR.

Summer—

Practical Pathology.	Practical Materia Medica.	Hospital Practice and
Post-Mortem Examinations.	Vaccination.	

Winter—

Surgery. Clinical Surgery. Pathology. Materia Medica.

Examination in Pathology and Materia Medica.

FOURTH YEAR.

Summer—

Ophthalmology.	Diseases of the Skin.	Clinical Medicine.
	Mental Diseases.	

Winter—

Medicine.	Midwifery.	Clinical Medicine.	Infectious Diseases.
Diseases of Ear, Nose, and Throat.			

FIFTH YEAR.

Summer—

Operative Surgery.	Public Health.	Diseases of Children.
Hospital Practice.	Forensic Medicine.	Dispensary Practice.

*Examination in Forensic Medicine and Public Health.**Winter—*

Practical Midwifery.	Clinical Medicine, Clinical Surgery, Clinical
Gynecology, and Anæsthetics.	Dispensary Practice.

SIXTH SUMMER.

Clinical Work in Hospital.

*Examination in Midwifery, Medicine, and Surgery, and corresponding Clinical Examinations.**B.—For Students Beginning in Winter.*

FIRST YEAR.

Winter—

Practical Chemistry (twice weekly).	Anatomy.	Chemistry.
Physics (Mon., Tues., and Thurs.).	Practical Anatomy.	

Examination in Chemistry and Physics.

Summer—

Botany. Zoology.
 Practical Botany } On alternate days. Practical Anatomy.
 Practical Zoology }
Examination in Botany and Zoology.

SECOND YEAR.

Winter—

Physiology. Practical Physiology (twice weekly).
 Practical Anatomy and Demonstrations.

Summer—

Histology. Practical Anatomy and Demonstrations.
Examination in Anatomy and Physiology.

THIRD YEAR.

Winter—

Practical Materia Medica. Surgery. Clinical Surgery.
 Pathology. Materia Medica.

Summer—

Practical Pathology. Post-Mortem Examinations and Hospital Practice.
 Vaccination.
Examination in Pathology and Materia Medica.

FOURTH YEAR.

Winter—

Medicine. Midwifery and Gynecology. Clinical Medicine.
 Dispensary Practice } (January-March).
 Practical Midwifery }

Summer—

Operative Surgery. Public Health. Diseases of Children.
 Hospital Practice. Forensic Medicine.
 Mental Diseases } (twice weekly).
 Infectious Diseases }

Examination in Forensic Medicine and Public Health.

FIFTH YEAR.

Winter—

Ophthalmology. Diseases of Ear, Nose, and Throat. Diseases of Skin.
 Clinical Medicine, Clinical Surgery, and Clinical Gynecology.
 Anæsthetics. Dispensary Practice. Practical Midwifery.

Summer—

Clinical Work in Hospital.
*Examination in Midwifery, Medicine and Surgery, and corresponding
 Clinical Examinations.*

The candidate must attend Hospital for not less than three years: must attend both Clinical Medicine and Clinical Surgery for a period of at least nine months; twenty cases of Midwifery, or twelve cases and three months' attendance at a Maternity Hospital; and Post-Mortem Examinations for three months.

It is required that, before commencing the study of Practical Midwifery, every student shall have held the offices of Clinical Medical Clerk and Surgical Dresser, and have attended a Course of Lectures on Surgery and Midwifery.

Two of the five years of study must be spent at the University, and not less than eight of the compulsory subjects of study must be taken in the University.

The minimum expense of M.B. and Ch.B., including fees for Classes, Hospital, Matriculation and Examination, amounts to about £143.

The University degrees are conferred on women students.

A complete curriculum is given by the School of Medicine for Women, Surgeons' Hall.

DEGREE OF M.D.

Each candidate for this degree, under the New Regulations, must be of the age of twenty-four years or upwards, and must have obtained the degrees of M.B. and Ch.B. of the University. He must either have been engaged for two years in general practice, or for one year in the naval or military medical services, or in the medical wards of a hospital, or in scientific research. He must present a thesis written by himself on a medical subject, and pass an examination in Clinical Medicine. In this examination the candidate has to write a report and commentary on at least three cases, and has to show a practical knowledge in the application of the ophthalmoscope, laryngoscope, electrical apparatus, and sphygmograph, in the examination of the blood, and in the chemical and microscopical examination of the excreta.

The candidate who has graduated M.B. and Ch.B. under the old regulations may either proceed to the degree of M.D. under the old regulations (under which he is not required to pass an examination in Clinical Medicine, but must have passed examinations in Greek and in Logic or Moral Philosophy), or he may proceed to the degree as if he had graduated M.B., Ch.B. under the New Regulations.

DEGREE OF CH.M.

Each candidate must be not less than twenty-four years of age, must possess the degrees of M.B., Ch.B., must have attended the surgical wards of a hospital for one year, or have spent one year in scientific research or in the naval or military medical services, or two years in practice other than that restricted to medicine. He must submit a thesis on a surgical subject, and pass an examination on Clinical Surgery and its branches, Surgical Anatomy, and Operations on the Dead Body.

FEES FOR M.D. AND CH.M.

The fee for the M.D. degree under the old regulations is five guineas; for the M.D. or Ch.M., under the New Regulations, ten guineas. The candidate must have paid the matriculation fee for the year in which he presents himself for examination or graduation. At each reappearance for examination, under the New Regulations, the fee is five guineas.

DEGREES IN PUBLIC HEALTH.

Two degrees are granted by the University of Edinburgh in the department of Sanitary Science, viz., B.Sc. and D.Sc.

BACHELOR OF SCIENCE.

Candidates must be graduates in Medicine of a University of the United Kingdom or of some other recognised University. In order to obtain the degree two examinations have to be passed.

First Examination.—Before entering for this examination the candidate must, after graduating in Medicine, have worked in a recognised Public Health Laboratory for eight months, of which five consecutive months must be passed in the Public Health Laboratory of the University of Edinburgh.

He must also have attended in a Scottish University a course of lectures on Physics and a course of lectures on Geology, extending over three months, and approved of by the University Court.

The subjects of examination are as follows :—

- (1) *Laboratory work*—Practical, written and oral; examination of water, air, foods, beverages, condiments, sewage; soils; disinfectants; building materials; clothing; bacteriology.
- (2) *Physics.* (3) *Geology.*

Second Examination.—This cannot be taken until eighteen months after graduating in medicine; nor sooner than six months after passing the First

B.Sc. Examination. The candidate must have attended two separate courses on Public Health, either in the University of Edinburgh or in some other recognised University or School.

Each course must consist of forty lectures, and include Medicine in its relation to Public Health and Sanitary Engineering.

The candidate must likewise produce evidence that (1) for six months he has studied sanitary work under a Medical Officer of Health for a county or burgh of not less than 25,000 inhabitants; (2) that he has studied clinically for three months infectious diseases in a recognised institution; (3) that for three months he has been instructed by a recognised teacher in mensuration and drawing.

The subjects of examination are :—

(1) Sanitation; (2) Sanitary Law; (3) Vital Statistics; (4) Medicine in Relation to Public Health.

The candidate is examined orally, practically, and by a written paper. *Sanitation* includes making reports on dwellings, workshops, hospitals and sanitary schemes.

The University Court may modify the work and instruction prescribed from time to time.

DOCTOR OF SCIENCE.

A graduate after having held the degree of B.Sc. for five years may present himself for the D.Sc. He must present a thesis or a published work or memoirs, the result of his own research, and must pass an examination in Public Health, and in such of its special subjects as the Senatus may determine. The candidate must submit the subject in which he proposes to be examined for approval not less than two months before the examination.

FEES PAYABLE.—First and second examinations, £3, 3s. each; for D.Sc., £10, 10s.

INSTITUTIONS FOR CLINICAL INSTRUCTION IN EDINBURGH.

Royal Infirmary. 860 beds and 40 cots. Fees perpetual ticket, £12; one year, £6, 6s.; six months, £4, 4s.; three months, £2, 2s. Clinical instruction is given daily in Medicine, Surgery, and all their special branches.

Royal Hospital for Sick Children. 120 beds. Hospital ticket, £1, 1s. Fee for Qualifying Course, £2, 2s.

City Hospital for Infectious Diseases. 600 beds. Fee, £1, 1s.

Royal Maternity and Simpson Memorial Hospital. 40 beds. The Maternity Residency affords accommodation for twelve students.

Royal Asylum, Morningside. 500 beds.

The fee for a qualifying course at each of these last two institutions is £2, 2s.

Victoria Hospital for Consumption and Diseases of the Chest. 50 beds. Out-Patient Department at 26 Lauriston Place.

Eye, Ear and Throat Infirmary. 6 beds: 2700 Out-Patients yearly. Fee for three months, £1, 1s.

Royal, New Town, Medical Missionary (Cowgate), Western, Provident (Marshall Street), Eye, and Skin Dispensaries.

PROFESSORS AND LECTURERS IN EDINBURGH.

The Courses given by the Extra-Mural Lecturers are recognised by the University and other examining boards as qualifying for graduation.

Botany— Professor Bayley Balfour, M.D., Botanical Gardens.
James A. Terras, B.Sc., New School.

Zoology— Professor J. Cossar Ewart, M.D., University.
Malcolm Laurie, D.Sc., Surgeons' Hall.
Marion I. Newbigin, D.Sc., Surgeons' Hall.

- Biology*— Malcolm Laurie, D.Sc., Surgeons' Hall.
Marion I. Newbigin, D.Sc., Surgeons' Hall.
- Physics*— Professor J. G. MacGregor, D.Sc., University.
C. G. Knott, D.Sc., University.
Dawson Turner, M.D., Surgeons' Hall.
- Chemistry*— Professor Walker, University.
G. H. Gemmell, F.I.C., 4 Lindsay Place.
T. W. Drinkwater, Ph.D., Surgeons' Hall.
- Anatomy*— Professor A. Robinson, M.D., University.
J. Ryland Whitaker, M.B., Surgeons' Hall.
- Applied Anatomy*— H. J. Stiles, M.B., University.
J. Ryland Whitaker, M.B., Surgeons' Hall.
- Physiology*— Professor E. A. Schäfer, LL.D., University.
Alexander Goodall, M.D., Surgeons' Hall.
- Materia Medica and Therapeutics*— Professor Sir Thomas R. Fraser, M.D., University.
William Craig, M.D., Surgeons' Hall.
Francis D. Boyd, C.M.G., M.D., New School.
John Orr, M.D., 27 Nicolson Square.
- Pathology*— Professor W. S. Greenfield, M.D., University.
Theodore Shennan, M.D., Surgeons' Hall.
James Miller, M.D., New School.
- Surgery*— Professor Alexis Thomson, University.
J. W. Dowden, F.R.C.S., New School.
A. A. Scot Skirving, C.M.G., F.R.C.S., 27 Nicolson Square.
Henry Wade, F.R.C.S., Surgeons' Hall.
G. L. Chiene, F.R.C.S., Brighton Street.
J. W. Struthers, F.R.C.S., New School.
W. J. Stuart, F.R.C.S., 59 Forrest Road.
Lewis Beesly, F.R.C.S., Surgeons' Hall.
- Clinical Surgery*— The Surgeons of the Royal Infirmary.
- Practice of Medicine*— Professor J. Wyllie, M.D., University.
J. J. Graham Brown, M.D., New School.
{ Harry Rainy, M.D., 27 Nicolson Square.
{ R. A. Fleming, M.D., 27 Nicolson Square.
G. Lovell Gulland, M.D., Surgeons' Hall.
{ Byrom Bramwell, M.D., New School.
{ Edwin Bramwell, M.D., New School.
Edwin Matthew, M.D., Surgeons' Hall.
- Clinical Medicine*— The Physicians of the Royal Infirmary.
- Midwifery and Gynaecology*— Professor Sir J. Halliday Croom, M.D., University.
D. Berry Hart, M.D., Surgeons' Hall.
J. W. Ballantyne, M.D., Surgeons' Hall.
A. H. F. Barbour, M.D., University and Royal Infirmary.
J. Haig Ferguson, M.D., New School.
W. Fordyce, M.D., New School.
N. T. Brewis, F.R.C.S., Royal Infirmary.
J. Lamond Lackie, M.D.
E. M. Inglis, M.B.
John M'Gibbon, M.B., 59 Forrest Road.
G. F. B. Simpson, M.D., New School.
H. S. Davidson, F.R.C.S.
B. P. Watson, M.D., 27 Nicolson Square.

Insanity— G. M. Robertson, M.D., University and Royal Asylum.

 { Sir J. Batty Tuke, M.D., Surgeons' Hall.

 { John Keay, M.D., Bangour Village Asylum.

Diseases of the Eye—

 G. Mackay, M.D., Royal Infirmary.

 W. G. Sym, M.D., Royal Infirmary.

 A. H. H. Sinclair, M.D. (Ophthalmoscopy), 45 Lauriston Place.

 J. V. Paterson, M.B., Cambridge Street.

Vaccination—J. B. Buist, M.D., Western and Cowgate Dispensaries.

 W. G. Aitchison Robertson, M.D., D.Sc., Royal Dispensary.

Diseases of Children—

 Staff of the Sick Children's Hospital.

Diseases of the Skin—

 Norman Walker, M.D., Royal Infirmary.

 Frederick Gardiner, M.D., Surgeons' Hall.

Diseases of the Ear, Nose and Throat—

 A. Logan Turner, M.D., Royal Infirmary.

 J. Malcolm Farquharson, M.B., Royal Infirmary.

 J. S. Fraser, M.B., Surgeons' Hall.

Forensic Medicine—

 Professor Harvey Littlejohn, F.R.C.S., University.

 W. G. Aitchison Robertson, M.D., D.Sc., Surgeons' Hall.

 John Macmillan, F.R.C.S.

Public Health—

 Professor C. Hunter Stewart, M.B., University.

 W. G. Aitchison Robertson, M.D., D.Sc., Surgeons' Hall.

 Wm. Robertson, M.D., Surgeons' Hall.

 John Macmillan, F.R.C.S.

Fevers—

 Alexander James, M.D., City Hospital.

 C. B. Ker, M.D., City Hospital.

Bacteriology—

 W. E. Carnegie Dickson, M.D., University.

 T. Shennan, M.D., Surgeons' Hall.

 J. Taylor Grant, M.D., 4 Lindsay Place.

 James Miller, M.D., New School.

Diseases of Tropical Climates—

 Major D. G. Marshall, I.M.S., University and Surgeons' Hall.

Practical Medicine and Physical Diagnosis—

 G. Lovell Gulland, M.D., Surgeons' Hall.

 R. A. Fleming, M.D., Nicolson Square.

 William Russell, M.D., Surgeons' Hall.

Neurology— J. J. Graham Brown, M.D., New School.

Diseases of the Chest—

 R. W. Philip, M.D., 26 Lauriston Place.

 G. Lovell Gulland, M.D., 26 Lauriston Place.

Medical Electricity and Röntgen Rays—

 Dawson Turner, M.D., Surgeons' Hall.

Diseases of the Blood—

 G. Lovell Gulland, M.D., Surgeons' Hall.

 Alexander Goodall, M.D., Surgeons' Hall.

Practical Anaesthetics—

 D. C. A. M'Allum, University.

History of Medicine—

 J. D. Comrie, M.D., University.

UNIVERSITY OF GLASGOW.

DEGREES OF M.B. AND CH.B.

Within recent years the facilities for both scientific and practical training have been much extended and improved. New and fully equipped laboratories have been added in connection with nearly all the scientific subjects, the most recent addition being a large building, just completed at a cost of £40,000, for the departments of Physiology, Materia Medica, and Public Health. There is a large and well-equipped Pathological Institute at the Western Infirmary in which the University Classrooms are placed, and the Professor of Pathology is *ex officio* Pathologist to the Infirmary, and has control of all the pathological material for purposes of instruction and investigation. A corresponding arrangement forms part of the new scheme just being completed with regard to the Royal Infirmary. The Western Infirmary is close to the University, and has hitherto been the chief field of clinical instruction of University students. A scheme has, however, been just carried through, according to which University Chairs, on the same footing as those already in existence, have been instituted at the Royal Infirmary in the subjects of Pathology, Medicine, Surgery, Midwifery, and Gynaecology. Students will thus have the option of taking the subjects of the two final years of study at the Royal Infirmary, and thus the advantage of a very wide clinical field along with systematic instruction under University Professors. The great disadvantage of attending classes at Gilmorehill and going to the Royal Infirmary, at a considerable distance, for clinical work will thus be done away with.

The latest development is the institution, at the Western Infirmary, of a Laboratory for Clinical Pathology, the Director of which will also be a University Lecturer and will give instruction to University students in the scientific methods of clinical diagnosis.

Under the New Ordinance of the University Court, which came into operation on 1st October 1911, the regulations for these Degrees (except in regard to the Preliminary Examination) have been considerably altered, the chief modifications being as follows:—1. A rearrangement of the subjects of the four Professional Examinations. 2. The rendering compulsory of some courses which hitherto have been optional. 3. The imposition of restrictions as to the period at which certain subjects of the curriculum can be taken.

The academical year is now divided into three terms of about ten teaching weeks each, and the following list gives the subjects of the several Professional Examinations, with the period of study required:—

FIRST EXAMINATION.

Chemistry (including Organic Chemistry), 2 terms ; with Practical Chemistry, 1 term.

Physics (with practical work), 1 term.

Botany (with practical work), 1 term.

Zoology (with practical work), 1 term.

SECOND EXAMINATION.

Anatomy and Practical Anatomy, 5 terms.

Physiology and Practical Physiology, 3 terms.

THIRD EXAMINATION.

Materia Medica and Therapeutics, 2 terms.

Pathology and Practical Pathology, 3 terms.

FOURTH EXAMINATION.

Medical Jurisprudence and Public Health, 2 terms.

Surgery, 2 terms.

Practice of Medicine, 2 terms.

Midwifery and Diseases Peculiar to Women and Infants, 2 terms.

The candidate must have attended the Medical and Surgical practice of a general hospital for three years, and courses of Clinical Surgery and Clinical Medicine of nine months in each case. He must also have received instruction, under conditions laid down, in the following subjects :—

Mental Diseases.
 Practical Pharmacy.
 Out-Patient Practice.
 Clinical Clerking in Medicine.
 Clinical Clerking or Dressing in Surgery.
 Post-Mortem Examinations.
 Infectious Diseases.
 Gynæcology.
 Diseases of Children.
 Ophthalmology.
 Diseases of the Ear and Throat.
 Dermatology.
 Practical Midwifery with the Conduct of Cases of Labour.
 Vaccination.
 Administration of Anæsthetics.
 Operative Surgery.

The following courses cannot be taken till after the end of the terms of the curriculum indicated in each case :—

Physiology and Practical Physiology—third term, and not (except Practical Histology) till at least two of the subjects of the First Examination have been passed.

Materia Medica and Therapeutics and Pathology and Practical Pathology—sixth term.

Medical Jurisprudence and Public Health—eighth term.

Midwifery, etc., Surgery and Medicine—ninth term, with the exception that Surgery may be attended after the sixth term, provided that the candidate has passed the Second Professional Examination.

Hospital Practice, Clinical Medicine, Clinical Surgery—sixth term.

The curriculum extends over five years, two of which must be spent in the University of Glasgow. The remaining three years may be spent elsewhere, as indicated in the Ordinance and under the conditions thereby imposed.

Except in the case of Medicine, Surgery, and Midwifery, the Senate may accept the Professional Examinations of other Scottish Universities.

There are a number of other administrative regulations which need not here be specified in detail.

The examination fees are £23, 2s. in all, with an additional fee of £1, 1s. for every re-entry. The cost of the curriculum amounts roughly to £145, spread over the five years of the course, and at present the class fees are charged at so much a class. There is, however, a movement on foot to introduce a “composition” or “inclusive” fee per session, but the total will work out at practically the above figure.

CLINICAL FACILITIES.

The following general hospitals, all of which are equipped in a modern fashion, are available for instruction of University Students, viz. the Western Infirmary close to the University and the Royal Infirmary, to which the new Medical Chairs will be attached, each of these having at present about 600 beds, and the Victoria Infirmary, with 260 beds, on the south side of the city.

The Eye Infirmarys at 174 Berkeley Street and 80 Charlotte Street (between them 100 beds), and the Ophthalmic Institution at 126 West Regent Street (35 beds), furnish ample opportunities for instruction in the important branch with which they deal; Insanity is equally well provided for at Gartnavel (of which the University Lecturer on that subject is Superintendent—460 beds), at Gartloch (806 beds), and at Woodilee (1160 beds), while the City

Fever Hospitals at Ruchill (540 beds) and Belvidere (680 beds) are available for the study of Zymotic Diseases. The Ear, the Throat and Nose, and the Skin are dealt with in the Western Infirmary.

A new Maternity Hospital, with every modern convenience and equipment, was recently opened in Rottenrow, with accommodation for 104 patients, and an Hospital for Sick Children, of greatly increased dimensions, in freer air, is in course of erection at Yorkhill within a short distance of the University, which will take the place of the existing building in Scott Street (74 beds). The beds at Yorkhill will number 200.

The Ordinance is applicable alike to men and women students, and much of the instruction is given in "mixed" classes by the Professors. There are, however, exceptions to this, some classes for women alone being held in a separate building (Queen Margaret College), and some for both sexes (in the main buildings at Gilmorchill) at different hours. The Hospital work in the case of women has hitherto been taken entirely in the Royal Infirmary, there being no accommodation for them in the Western. This arrangement is likely to continue.

PROFESSORS.

<i>Zoology</i> —	Professor Graham Kerr, M.A., F.R.S.
<i>Chemistry</i> —	Professor Ferguson, M.A., LL.D., F.S.A.
<i>Practical Physics</i> —	
	Professor Gray, M.A., LL.D., F.R.S.
<i>Botany</i> —	Professor Bower, D.Sc., F.R.S.
<i>Anatomy</i> —	Professor Bryce, M.A., M.D.
<i>Physiology</i> —	Professor Noël Paton, B.Sc., M.D.
<i>Materia Medica and Therapeutics</i> —	
	Professor Stockman, M.D.
<i>Pathology</i> —	Professor Muir, M.A., M.D., F.R.S.
<i>Medical Jurisprudence and Public Health</i> —	
	Professor Glaister, M.D., D.P.H.(Camb.).
<i>Surgery and Clinical Surgery</i> —	
	Professor Sir William MacEwen, M.D., LL.D., D.Sc., F.R.S.
<i>Midwifery</i> —	Professor Murdoch Cameron, M.D.
<i>Practice of Medicine and Clinical Medicine</i> —	
	Professor Gemmell, M.D.
<i>Public Health</i> —	
	Professor Glaister, M.D., D.P.H. (Camb.).
<i>Pathology</i> —	Professor John H. Teacher, M.A., M.D.
<i>Medicine and Clinical Medicine</i> —	
	Professor Walter K. Hunter, D.Sc., M.D.
<i>Surgery and Clinical Surgery</i> —	
	Robert Kennedy, M.A., D.Sc., M.D.
<i>Midwifery</i> —	
	John M. Munro Kerr, M.D.

LECTURERS.

<i>Organic Chemistry</i> —	
	T. S. Patterson, Ph.D., D.Sc.
<i>Physiological Chemistry</i> —	
	E. P. Cathcart, M.D., D.Sc.
<i>Psychological Physiology</i> —	
	Henry J. Watt, M.A., Ph.D.
<i>Public Health</i> —	
	Professor Glaister, M.D., D.P.H.(Camb.).

<i>Ear</i> —	Thomas Barr, M.D.
<i>Throat and Nos.</i>	James Walker Downie, M.B.
<i>Skin</i> —	John Wyllie Nicol, M.B.
<i>Bacteriology</i> —	Carl H. Browning, M.D.
<i>Physics</i> —	James G. Gray, D.Sc.
<i>Embryology</i> —	James F. Gemmill, M.A., D.Sc., M.D.
<i>Applied Anatomy</i> —	Robert Kennedy, M.A., D.Sc., M.D.
<i>Insanity</i> —	Landel R. Oswald, M.B.

DEGREE OF M.D.

This degree is open to holders of the M.B., Ch.B. diploma, after a period of one or two years, according to circumstances, has elapsed since the date of the latter. The requirements are (*a*) an Examination in Clinical Medicine, or in some approved department of Medical Science or Practice, (*b*) a Thesis on any branch of knowledge comprised in the examinations for M.B., Ch.B., excepting a subject which is exclusively surgical, and (*c*) a fee of £15, 15s., with an extra charge of £5, 5s. for each re-entry.

DEGREE OF CH.M.

This may be obtained on practically the same terms as the M.D. degree, the only differences being (1) that the examination is on Surgical Anatomy, operations upon the dead body, and Clinical Surgery or an approved special department of Surgery, and 2 that the Thesis must not be on a subject which is exclusively medical.

DEGREE OF B.Sc. IN PUBLIC HEALTH.

Candidates must be graduates in Medicine of a University in the United Kingdom or of some other University recognised for the purpose by the Glasgow University Court, and they must thereafter have received practical instruction, including instruction in Chemistry, Bacteriology, and the Pathology of the Diseases of Animals transmissible to man, for at least twenty hours per week during a minimum period of eight months, five consecutive months of which must be in the Public Health Laboratory of the University of Glasgow. Either before or after graduation in Medicine they must also have attended, in the University of Glasgow or elsewhere, courses of Physics and Geology, and after graduation two separate courses in Public Health (Medicine and Engineering), as well as practically studying sanitary work for six months under a Medical Officer of Health in the United Kingdom, or a Sanitary Staff Officer of Health of the Royal Army Medical Corps, besides attending three months' practice of an Hospital for Infectious Diseases, where methods of administration can be studied, and three months in Mensuration and Draining. The examinations are, *First*, Public Health Laboratory Work, Physics, and Geology; *Second*, Sanitation, Sanitary Law, Vital Statistics, and Medicine in its bearings on Public Health. The examination fee is £6, 6s.

DEGREE OF D.Sc. IN PUBLIC HEALTH.

Five years after obtaining the B.Sc. degree, graduates may proceed to the higher Degree of D.Sc., the requirements being *a*) a Thesis or a published memoir or work to be approved by the Senate; and (*b*) an examination in Public Health and in such of its special departments as the Senate and University Court may determine. The fee for this degree is £10, 10s.

QUEEN MARGARET COLLEGE FOR WOMEN.

A full course of medicine and surgery is obtainable partly at Queen Margaret College, but in recent years the tendency has been to have mixed classes at Gilmorehill. The regulations, fees, etc., are similar to those for men. The buildings are pleasantly situated in grounds of their own, close to the Botanic Gardens. The anatomical department is excellently arranged and most complete. Clinical work is amply provided for in the Royal Infirmary and its Dispensaries, and in the Royal Hospital for Sick Children, the Glasgow Maternity Hospital, the Royal Asylum of Gartnavel, and the Belvidere Fever Hospital. There are also arrangements for special study and research.

Students can have board and lodging at Queen Margaret Hall, within easy reach of the College, at the rate of about one guinea per week.

All information necessary can be obtained from Miss Melville, Queen Margaret College, Glasgow.

ST. MUNGO'S COLLEGE.

This, the Medical School of the Royal Infirmary, the largest hospital in Glasgow, is situated in Cathedral Square, Castle Street, and has car communication with every part of the city. St. Mungo's College is in the Infirmary grounds.

The Infirmary has, including the Ophthalmic Department, over 620 beds, the average number occupied in 1905 being 600. When the reconstruction of the Infirmary, long in progress, is completed, it will have about 700 beds. There are special beds and wards for Diseases of Women, of the Throat, Nose and Ear, Venereal Diseases, Burns, and Septic Cases.

At the Outdoor Department the attendances in 1905 numbered over 62,000. In addition to the large Medical and Surgical Departments, there are Departments for Special Diseases—namely, Diseases of Women, of the Throat and Nose, of the Ear, of the Eye, of the Skin, and of the Teeth. A fully-equipped Electrical Pavilion was opened a few years ago, and year by year the latest and most approved apparatus for diagnosis and treatment has been added. Wards are set apart for the teaching of women students.

Appointments.—Five House-Physicians and nine House-Surgeons, having a legal qualification in Medicine and Surgery, who board in the Hospital free of charge, are appointed every six months. Clerks and Dressers are appointed by the Physicians and Surgeons. As a large number of cases of Acute Diseases and Accidents of a varied character are received, these appointments are very valuable and desirable.

Fees.—The fees for hospital attendance, including Clinical Lectures and Tutorial Instruction, attendance at the Outdoor Department, at the Pathological Department, Post-Mortem Examinations, and the use of the Museum, which has not long since been rearranged and catalogued, are as follows:—For one year, £10, 10s. ; for six months, £6, 6s. ; for three months, £4, 4s. Students who have paid fees to the amount of £21 to the Glasgow Royal Infirmary are permitted to attend, in any subsequent year or years, one Winter and one Summer Course of Instruction in the Infirmary without further payment ; and Students who have paid to any other hospital in the United Kingdom fees, being not less than £21, in virtue of which they are entitled to attend without further payment, shall be admitted as Students of the Royal Infirmary on payment of £3, 3s. for six months, or £1, 11s. 6d. for three months.

ANDERSON'S COLLEGE MEDICAL SCHOOL,

DUMBARTON ROAD, PARTICK, GLASGOW.

The old Institution known as "Anderson's University" was founded by the will of John Anderson, M.A., F.R.S., in 1795, and the medical school connected therewith dates back to the year 1799.

In 1877 the name of the Institution was altered from "Anderson's University" to "Anderson's College." In 1887 the medical school of Anderson's College became a distinct Institution known as "Anderson's College Medical School."

The new buildings are situated in Dumbarton Road, immediately to the west of the entrance of the Western Infirmary and four minutes' walk from the University. They are constructed on the best modern principles, and are provided with all the appliances requisite for the conduct and management of a fully-equipped medical school.

Classes are conducted in all the subjects of the five years' curriculum :—

Anatomy—Professor A. M. Buchanan, M.A., M.D.

Physics—Professor Peter Bennett.

Chemistry—Professor J. Robertson Watson, M.A.

Botany—Professor B. G. Cormack, M.A., B.Sc.

Zoology—Vacant.

Physiology—Professor A. J. Ballantyne, M.D., Ch.B.

Materia Medica—Professor J. P. Duncan, M.B., B.Sc.

Medical Jurisprudence—Professor Carstairs Douglas, D.Sc., M.D., F.R.S.E.

Midwifery—Professor J. M. Munro Kerr, M.D., C.M.

Surgery—Professor G. Burnside Buchanan, B.A., M.B.

Practice of Medicine—Professor John Cowan, B.A., D.Sc., M.D.

Ophthalmic Medicine and Surgery—A. Freeland Fergus, M.D., F.R.S.E.

Aural Surgery—James Galbraith Connal, M.B.

Diseases of Throat and Nose—John Macintyre, M.B., F.R.S.E.

Mental Diseases—John Carswell, F.R.F.P.S.G.

Public Health Laboratory—Professor Carstairs Douglas, D.Sc., M.D., F.R.S.E.

Pathology—At the Western or Royal Infirmary.

Degrees and Diplomas.—Certificates of attendance on the classes at Anderson's College Medical School are received by the Universities of London and Durham, by the Royal University of Ireland, and by all the Royal Colleges and Licensing Boards in the United Kingdom. They are also recognised by the Universities of Glasgow and Edinburgh under certain conditions which are stated in the Calendar of this school. The Public Health Laboratory Course is recognised as qualifying for the Diploma granted by the University of Cambridge, the Scottish Conjoint Board, and the Royal Irish Colleges.

Candidates for the Licence in Dental Surgery can obtain at this school the full medical curriculum which is required. The courses special to dentistry are conducted at the Glasgow Dental School, 15 Dalhousie Street.

Malcolm Kerr Bursary in Anatomy. Value about £10. Open to students of the junior anatomy class during session 1907-1908.

The Carnegie Trust will pay the fees of students at Anderson's, on conditions regarding which particulars may be obtained from Sir W. S. McCormick, LL.D., Carnegie Trust Offices, Edinburgh.

Class Fees.—For each course of lectures (anatomy, ophthalmic medicine and surgery, aural surgery, diseases of throat and nose and mental diseases excepted): first session, £2, 2s.; second session (in Anderson's College), £1, 1s.; afterwards free. For practical classes (except anatomy), viz., chemistry, botany, zoology, physiology, pharmacy, operative surgery: first session, £2, 2s.; second session, £2, 2s.

Reduced joint fees in zoology and in botany, for lectures and practical class when taken in same summer session, £3, 3s.; for either course separately, £2, 2s.

Anatomy Class Fees.—Winter—first session (including practical anatomy), £4, 4s.; second session (including practical anatomy), £4, 4s.; third session, £2, 2s.

Summer—lectures and practical anatomy, £2, 12s. 6d.; lectures alone, £1, 11s. 6d.; practical anatomy alone, £1, 11s. 6d.; osteology and practical anatomy, £2, 12s. 6d.; osteology alone, £1, 11s. 6d.; practical anatomy alone, £1, 11s. 6d.

Ophthalmic Medicine and Surgery (including hospital practice), *Anal Surgery*, *Diseases of Throat and Nose and Mental Diseases*, £1, 1s.

Matriculation Fee.—Winter, 10s. (5s. for a single class); for summer session only, 5s.

ABERDEEN UNIVERSITY.

The course of study for the degree of M.B., Ch.B. extends over five years, of which two at least must be spent in the University of Aberdeen.

The curriculum is the same as in the other Scottish Universities as far as relates to attendance on University classes, to clinical study at a General Hospital, to attendance on courses of Clinical Surgery, Clinical Medicine, Mental Diseases, and Practical Pharmacy, to instruction in Vaccination, to attendance on Cases of Labour, and to the practice of a Dispensary.

The candidate must also, before admission to the final examination, produce the following certificates:—

1. That he has acted as Clerk in the Medical and Dresser in the Surgical Wards of a Public Hospital, each for a period equivalent to one Winter Session.

2. That he has been present at not fewer than twenty-five post-mortem examinations at a Hospital or Dispensary, some of which he must have taken part in performing.

3. That he has attended for at least three months the practice of a General Fever Hospital with not fewer than forty beds.

4. That he has attended for at least three months a course of clinical instruction in the Diseases of Children.

5. That he has attended for at least three months the Ophthalmological practice of a Hospital or Dispensary, where special provision is made for giving instruction.

Certificates for these various classes and courses must attest not only regular attendance, but also due performance of the work.

There is no prescribed order of study, but a scheme, representing the minimum curriculum, has been drawn up for the guidance of students, and is printed in the Calendar.

THE FOLLOWING ARE THE CLASSES IN THE MEDICAL FACULTY:— WINTER SESSION.

Zoology—Professor John Arthur Thomson, M.A.

Chemistry—Professor Japp, M.A., LL.D., F.R.S.

Anatomy—Professor Reid, M.D., F.R.C.S.

Practical Anatomy—Professor Reid and Assistants.

Physiology (Syst. and Pract.)—Professor MacWilliam, M.D.

Materia Medica—Professor Cash, M.D., F.R.S.

Pathology (Syst. and Pract.)—Professor George Dean, M.B., C.M.

Surgery—Professor John Marnoch, M.A., M.B., C.M.

Medicine—Professor Finlay, B.A., M.D., F.R.C.P.

Midwifery and Diseases of Women and Children—Professor Stephenson, M.D., F.R.C.S.

SUMMER SESSION.

Botany—Professor Trail, M.A., M.D., F.R.S.

Practical Botany—Professor Trail.

Zoology—Professor Thomson.

Practical Zoology—Professor Thomson.

Physics—Professor Niven, M.A., D.Sc., F.R.S.

Practical Chemistry—Professor Japp and Assistants.

Practical Anatomy—Professor Reid and Assistants.

Practical Materia Medica and Pharmacy—Professor Cash and Assistants.

Physiology (Syst. and Pract.)—Professor MacWilliam.

Forensic Medicine—Professor Hay, M.D., LL.D.

Practical Hygiene and Forensic Medicine—Professor Hay.

Pathology (Syst. and Pract.)—Professor Dean.

Practical Midwifery and Gynæcology and Clinical Diseases of Children.—Professor Stephenson.

Systematic and Practical Pathology, and Systematic and Practical Physiology respectively are now taught as part of one continuous course, occupying a whole academic year, *i.e.* a summer and a winter session.

There are Assistants to the Professors in the Medical Faculty appointed annually, two in the Department of Anatomy, Physiology, Materia Medica and Chemistry, and one in each of the other departments.

Clinical Medicine and Clinical Surgery are taught by the Physicians and Surgeons of the Royal Infirmary.

The following are recognised as Lecturers :—

Lecturer on Mental Diseases . . .	Wm. Reid, M.D.
„ Ophthalmology . . .	{ C. H. Usher, M.B., B.S., F.R.C.S. A. Rudolph Galloway, M.A., M.B., C.M.
Lecturer on Vaccination . . .	T. Fraser, M.A., M.B., Ch.B.
„ Skin Diseases . . .	J. F. Christie, M.A., M.B., C.M.
„ Diseases of Ear, Throat . . .	{ J. Mackenzie Booth, M.D., C.M. H. Peterkin, M.B.
„ and Nose . . .	{ H. Peterkin, M.B.
„ Medical Electricity . . .	J. R. Levaack, M.B., C.M.
„ Anæsthetics . . .	{ A. W. Falconer, M.D. D. W. Geddie, M.B., C.M.

All the University Classes are held at Marischal College.

Tutorial Classes are held in connection with most of the Systematic Courses, and practical instruction is given in the fully-equipped Laboratories connected with the several departments.

Graduates or others desirous of engaging in special study or research may be allowed by the Senatus to work in any of the Laboratories on payment of the usual matriculation fee.

General clinical instruction is obtained in the following Medical Institutions :—

The Royal Infirmary of Aberdeen.

This General Hospital, situated about seven minutes' walk from Marischal College, has been recently constructed on the most modern principles, and is fully equipped with all the requirements for medical work and teaching. It accommodates upwards of two hundred patients: the number of patients admitted during the year 1910 was 3140, and the number of out-patients treated during the same period was 17,637.

Six resident medical officers are appointed annually, three in May and three in September, to hold office for twelve months. Salary, £26, 5s. with board.

Fees.—Perpetual fee to hospital practice, £6, or first year, £3, 10s., second year, £3, afterwards free; clerkship in medicine, £1, 1s.; dressership in surgery, £1, 1s.; pathological demonstrations, £2, 2s. (Special courses of lectures are charged for.)

The Royal Hospital for Sick Children

Is situated about five minutes' walk from Marischal College, and accommodates over 80 patients. The number of patients admitted in 1909 was 734, and the number of out-patients treated 1784. No infectious disease except diphtheria is treated. Each student must act as clerk for six weeks in the medical and surgical wards respectively.

There is one qualified house physician and surgeon (resident) who holds office for six months. Salary at the rate of £25 per annum.

Fee for hospital practice, £2, 2s. first year; subsequent years, £1, 1s.

The Royal Asylum

Is about fifteen minutes' walk from Marischal College. It accommodates over 950 patients, and has been recently fitted up with a fully-equipped hospital and a laboratory.

The senior physician is recognised by the University as lecturer on mental diseases, and delivers a qualifying course of lectures.

The City (Fever) Hospital

Is about ten minutes' walk from Marischal College, and accommodates 200 patients.

Senior students are admitted for instruction in fevers twice a week under the visiting physician (who is the Medical Officer of Health for the City) and his assistant. Fee, £1, 1s.

General Dispensary, Maternity Hospital and Vaccine Institution.

This is about five minutes' walk from Marischal College.

The total number of cases treated during 1910 was 13,398, and the number of patients treated at their own homes 2247. There were 457 midwifery cases.

Fees.—General practice, £3, 3s.; vaccination certificate and instruction, £1, 1s.; Maternity Hospital, £3, 3s.

Ophthalmic Institution.

This Institution is situated about three minutes' walk from Marischal College. The surgeon in charge is recognised by the University as a lecturer on ophthalmology.

During 1910, 50 in-patients and 4537 out-patients were treated.

PROFESSIONAL EXAMINATIONS.

There are four examinations: the subjects and regulations of these are common to the Universities of Aberdeen and Glasgow.

DEGREE OF M.D.

The regulations with regard to the age and other qualifications of the candidate are similar to those in the other Scottish Universities. He must submit a thesis written by himself upon any medical subject, and pass an examination in Clinical Medicine and in such Special Departments of Medicine as he may select.

DEGREE OF CH.M.

Each candidate must be not less than twenty-four years of age, and must hold the degree of M.B., Ch.B. of the University. He must produce a certificate of having been engaged for at least one year in attendance in the surgical wards of a hospital, or in scientific research, or in the naval and military services, or for two years in practice other than practice restricted to medicine. He must present a thesis on a surgical subject and pass an examination on Clinical Surgery, Surgical Anatomy, and Operations on the Dead Body.

DIPLOMA IN PUBLIC HEALTH (D.P.H.).

The diploma is conferred, after special instruction and examination, on any one who has been at least twelve months a graduate in medicine of a University in the United Kingdom; if not a graduate of Aberdeen University, the candidate must attend a course of instruction in this University in one or more subjects embraced in the examination for the diploma.

Each candidate must have attended a course of instruction in Public Health.

The qualifying post-graduate instruction embraces—

(a) Regular attendance, for three months, at a hospital for infectious

diseases, at which opportunities are afforded for the study of methods of administration.

(b) Daily association for a period of six months (of which at least three months must be distinct from the period of laboratory instruction) in the duty, routine and special, of Public Health Administration, under the supervision of a recognised Medical Officer of Health.

(c) Practical instruction, for at least six months, in laboratory work, which includes examination of water, air, soil and foods, and the study of bacteriology, disinfection, ventilation, water supply and sewerage, and the framing of reports of analysis. The laboratory attendance must extend over at least fifteen hours a week.

The qualifying courses of laboratory instruction in Aberdeen University are given in the Public Health Laboratory (Fee, £6, 6s.), and the Bacteriological Laboratory (Fee, £4, 4s.).

Instruction is given in the Drawing and Interpretation of Plans (Fee, £1, 1s.).

The diploma is conferred after an examination in March and July of each year.

The examination is written, oral and practical, and is divided into two parts.

Part I. embraces the following subjects in their application to Public Health :—

(a) Physics, Engineering and Meteorology.

(b) Chemistry, Microscopy and Bacteriology.

Part II. embraces—

(a) General Hygiene.

(b) Sanitary Law and Vital Statistics.

Part I. may be taken alone, or both parts together.

The written examinations occupy two days, and the oral and laboratory and outdoor examinations three to four days.

Candidates must send in their names and pay the fees a fortnight before the examination. Examination Fee is five guineas. Re-examination fee one guinea.

SUMMARY OF FEES.

I. UNIVERSITY FEES.

(a) Preliminary Examination (each occasion)	.	.	.	£0	10	6
(b) Matriculation—For whole year	.	.	.	1	1	0
For Summer Session	.	.	.	0	10	6
(c) Class Fees—						
Each Systematic Course—For Winter or Full Course	.	.	.	4	4	0
Each subsequent attendance	.	.	.	3	3	0
For Summer or Half Course	.	.	.	3	3	0
Each subsequent attendance	.	.	.	3	3	0
Each Practical Course and subsequent attendance	.	.	.	3	3	0
Except { Practical Anatomy in Summer	.	.	.	2	2	0
{ Practical Midwifery	.	.	.	2	2	0
(d) Degree Fees—For M.B., Ch.B.—						
1st Professional Exam.	.	.	.	5	5	0
2nd „ „	.	.	.	5	5	0
3rd „ „	.	.	.	5	5	0
4th „ „	.	.	.	7	7	0
					23	2
Re-examination Fee for not more than two subjects	.	.	.	1	1	0
for each additional subject	.	.	.	0	10	6
For M.D.	.	.	.	10	10	0
For Ch.M.	.	.	.	10	10	0
Re-examination Fee	.	.	.	2	2	0

The large asylum at Liff provides material for instruction in mental diseases, and the City Fever Hospital for that in fevers. The Dundee Eye Institution affords cases for teaching in ophthalmology.

The Diploma of Public Health (D.P.H.) of St. Andrews University may be taken at University College, Dundee.

All classes in the University are open to men and women alike. The session is divided into three terms—Martinmas Term begins 11th October and ends 15th December 1911. Candlemas Term begins 9th January and ends 19th March 1912. Whitsunday Term begins 17th April and ends 26th June 1912.

UNITED COLLEGE, ST. ANDREWS.

PROFESSORS AND LECTURERS.

- Physics*— Professor Butler, M.A.
Chemistry— Professor Irvine, Ph.D., D.Sc.
Zoology— Professor Mackintosh, M.D., LL.D., F.R.S.
Botany— R. A. Robertson, M.A., B.Sc.
Physiology—Professor Herring, M.D.
Anatomy— Professor Musgrove, M.D., F.R.C.S.
Regional Anatomy—
 D. D. Craig, B.Sc., M.B.

UNIVERSITY COLLEGE, DUNDEE.

PROFESSORS AND LECTURERS.

- Physics*— Professor Peddie, D.Sc.
Chemistry—Professor Hugh Marshall, D.Sc., F.R.S.
Zoology— Professor Thompson, M.A., C.B.
Botany— Professor Geddes, F.R.S.E.
Physiology—Professor Waymouth Reid, M.B., F.R.S.
Anatomy— Principal Mackay, M.D., LL.D.
 Lieut.-Col. Lamont, M.B., I.M.S. (retired).
Surgery— Professor MacEwan, M.D., C.M.
Surgery, Clinical—
 D. M. Greig, C.M., F.R.C.S.
Medicine— Professor Stalker, M.D.
Medicine, Clinical—
 Professor Stalker, M.D. ; J. Mackie Whyte, M.D.
Materia Medica—
 Professor C. R. Marshall, M.D.
Pathology—Professor Sutherland, M.B.
Midwifery and Gynaecology—
 Professor Kynoch, M.B., F.R.C.P., L.R.C.S.
Midwifery and Gynaecology, Clinical—
 Professor Kynoch, M.B.
 R. C. Buist, M.D.
Forensic Medicine—
 C. Templeman, M.D., D.Sc., M.O.H.
Ophthalmology—
 Angus MacGillivray, M.D.
Diseases of Ear, Nose, and Throat
 G. Taylor Guild, M.B.

Diseases of Children—

D. M. Greig, C.M., F.R.C.S.

J. S. Y. Rogers, M.B.

Diseases of Skin—

W. E. Foggie, M.D.

Mental Diseases—

W. Tuach Mackenzie, M.D.

Vaccination—

R. C. Buist, M.D.

Clinical Pathology—

F. M. Milne, M.B., D.P.H.

Clinical Medical Tutor—

Charles Kerr, M.D.

Dean of the Faculty of Medicine—

Professor Kynoch.

QUALIFICATIONS GIVEN BY THE SCOTTISH COLLEGES.

The Royal College of Physicians of Edinburgh, the Royal College of Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow, conjointly confer the Triple Qualification (L.R.C.P.E., L.R.C.S.E., L.R.F.P.S.G.). Female candidates are admitted to the examinations for this qualification.

PRELIMINARY EXAMINATION.—This examination must be passed before the student commences professional study. It may be passed before any of the Boards recognised by the General Medical Council, and enumerated in the Regulations of the Colleges. The Educational Institute of Scotland conducts a qualifying Preliminary examination for medical students, in Edinburgh and Glasgow, on behalf of the Colleges. This examination embraces English, Latin, Mathematics, and either Greek, French, German, Italian, or other modern language. All the subjects must be passed at one time. Calendar, containing examination papers, can be had from S. M. Murray, Esq., 34 North Bridge, Edinburgh. Price 1s.

PROFESSIONAL EDUCATION.—The curriculum must extend over five years. Graduates in Arts or Science of any recognised University who have spent a year in the study of Physics, Chemistry, and Biology, and have passed an examination in these subjects for the degrees in question, are exempted from the first year of study. The fifth year of study should be devoted to clinical work in one or more recognised Hospitals or Dispensaries, and to the study of special diseases. For information regarding the payment of class fees by the Carnegie Trust, *vide* p. 333.

ORDER OF STUDY WHICH IS RECOMMENDED.

First Summer— Physics and Elementary Biology.

First Winter— Five months' course in Chemistry and Anatomy; three months' course in Practical Chemistry; Practical Anatomy.

Second Summer— Practical Anatomy; Practical Physiology.

Second Winter— Practical Anatomy; Physiology—Five months' course.

Third Summer— Three months' course in Practical Pathology, Materia Medica, and Practical Materia Medica; Surgical Hospital Practice.

Third Winter— Six months' course in Surgery and Clinical Surgery; Attendance at Surgical Wards; Pathology.

Fourth Summer— Three months' course in Midwifery and Gynecology, in Medical Jurisprudence and Public Health, and in Clinical Surgery; Hospital Practice.

Fourth Winter— Six months' course in Medicine and Clinical Medicine; Hospital Practice.

Fifth Summer— Three months at Clinical Medicine ; Hospital ; Insanity ; Diseases of Children ; Diseases of Eye.
Practical Midwifery—Personal attendance on twelve cases under the supervision of a medical practitioner, or three months' attendance at a Lying-in Hospital and personal attendance on six cases.

Fifth Winter— Hospital Practice ; Fevers ; Dispensary ; Vaccination ; Skin Diseases ; Ear and Throat Diseases ; Eye Diseases ; Operative Surgery.

PROFESSIONAL EXAMINATIONS.—Four of these are held during the curriculum. Each is held quarterly in Edinburgh and twice a year in Glasgow. Candidates may enter for all or any of the subjects at the First, Second, and Third Examinations. In the Final Examination the subjects of Medicine, Surgery and Midwifery shall be taken together at the conclusion of five Winters and five Summers of Medical Study, provided that a period of twenty-four months has elapsed since passing the Second Professional Examination ; and the subject of Medical Jurisprudence and Public Health may be taken at any time after passing the Third Examination. Candidates are advised to enter for the entire examinations.

First Examination— Physics, Chemistry and Elementary Biology. This should be passed before the beginning of the second winter session.

Second Examination— Anatomy, Physiology, including Histology. This should be passed at the end of the second year of study.

Third Examination— Pathology, Materia Medica and Pharmacy. This should be taken at the end of the third year.

Final Examination— Can only be taken at the end of the fifth year. The candidate must have attained the age of twenty-one.

It includes—

1. Medicine, Therapeutics, Medical Anatomy, Clinical Medicine.
2. Surgery, Surgical Anatomy, Clinical Surgery, Diseases of the Eye.
3. Midwifery and Diseases of Women and New-born Children.
4. Medical Jurisprudence and Public Health. This can be taken any time after the Third Examination.

FEES FOR PROFESSIONAL EXAMINATIONS.

For each of the first three, £5 ; for the final, £15. The minimum total expense, inclusive of fees for classes and examinations, amounts to £115.

DIPLOMA IN PUBLIC HEALTH OF THE ROYAL COLLEGES.

The Diploma is granted by the Triple Qualification Board.

1. Every candidate for examination must have held a registrable medical qualification for one year.

2. After obtaining such qualification he must have attended during six months a recognised Laboratory in which Chemistry, Bacteriology, and the Pathology of the Diseases of Animals transmissible to man are taught ; and the certificate must show that the candidate has conducted Chemical and Bacteriological analyses of air, water, sewage and foods, and certify that the candidate has attended not less than fifteen hours per week.

3. After obtaining a medical qualification he must during six months have been engaged in acquiring a practical knowledge of the duties of Public Health Administration, under the supervision of—

- (a) In England or Wales, the Medical Officer of Health of a County or single sanitary District having a population of not less than 50,000, or a Medical Officer of Health devoting his whole time to Public Health work ; or

- (b) In Scotland or Ireland the Medical Officer of Health of a County or District or Districts with a population of not less than 30,000; or
 - (c) In Ireland, a Medical Superintendent Officer of Health of a District or Districts having a population of not less than 30,000; or
 - (d) In the British Dominions outside the United Kingdom, a Medical Officer of Health of a Sanitary District having a population of not less than 30,000, who himself holds a Registrable Diploma in Public Health; or
 - (e) A Medical Officer of Health who is also a teacher in the Department of Public Health in a recognised medical school.
 - (f) A Sanitary Staff Officer of the Royal Army Medical Corps having charge of an Army Corps, District or Command, recognised for the purpose by the General Medical Council.
4. After obtaining a medical qualification he must have attended for three months at least twice weekly the practice of a Hospital for Infectious Diseases. The examination consists of two parts. The first part includes—(a) Laboratory work, with Chemistry and Bacteriology; (b) Physics and Meteorology. The Second Examination embraces—(a) Report on premises visited; (b) Examination at Fever Hospital; (c) Examination at Public Abattoir; (d) Epidemiology and Endemiology; (e) Vital Statistics and Sanitary Law; (f) Practical Sanitation.
- Each examination is held bi-annually, in October and May. The fee for each is £6, 6s.; for re-examination, £3, 3s. Fees and applications to be lodged with Mr. James Robertson, 54 George Square, Edinburgh; or with Mr. Alex. Duncan, LL.D., 242 St. Vincent Street, Glasgow.

MEMBERSHIP AND FELLOWSHIP OF THE ROYAL COLLEGE OF PHYSICIANS, EDINBURGH.

Every applicant for the *Membership* must possess a recognised qualification, and be not less than twenty-four years of age. He must pass an examination on Medicine and Therapeutics, on Clinical Medicine, and on some Special Department of Medicine, such as Psychological Medicine, Pathology, Medical Jurisprudence, Public Health, Midwifery, Gynæcology, Neurology, Diseases of Children, Tropical Medicine, etc. The Membership is conferred by election.

The fee for the Membership is thirty-five guineas, except the applicant be a Licentiate of the College, when it is twenty guineas.

Members of not less than three years' standing may be raised by election to the *Fellowship*, the fee being thirty-eight guineas, exclusive of Stamp Duty of £25.

FELLOWSHIP OF THE ROYAL COLLEGE OF SURGEONS, EDINBURGH.

Every candidate must be twenty-five years of age, and must have been engaged for two years in the practice of his profession, after having obtained a recognised qualification in Surgery. The petition for examination must be signed by two Fellows—a proposer and seconder.

The candidate must pass an examination on Principles and Practice of Surgery, including Surgical Anatomy, Clinical Surgery, and any one of the optional subjects: Ophthalmic Surgery, Aural, Nasal and Laryngeal Surgery, Dental Surgery, Surgical Pathology and Operative Surgery, Gynæcology, Advanced Midwifery with Obstetric Surgery, Advanced Anatomy.

The fee is £45, except the candidate be a Licentiate of the College when the fee is £35. Further particulars may be obtained from the Clerk to the College, 54 George Square, Edinburgh.

FELLOWSHIP OF THE ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

Every candidate must have been qualified for two years, and be aged twenty-four. Admission to the Fellowship is by examination and subsequent

election. The candidate is examined on either (*a*) Medicine (including Clinical Medicine, Medical Pathology, and Therapeutics), or (*b*) Surgery (including Clinical Surgery, Operative Surgery, Surgical Anatomy, and Surgical Pathology); and on one optional subject—Anatomy, Physiology, Pathology, Midwifery, Diseases of Women, Medical Jurisprudence, Ophthalmic Surgery, Aural, Laryngeal and Nasal Surgery, Dental Surgery, State Medicine, Psychological Medicine or Dermatology.

The fee is £30, except the candidate be a Licentiate of the Faculty, when it is £15.

MEDICAL EDUCATION OF WOMEN IN EDINBURGH.

SCHOOL OF MEDICINE FOR WOMEN, SURGEONS' HALL.

The courses of instruction given in this School qualify for graduation in Medicine. The curriculum and class fees are the same as for male students proceeding to the University Degree or College Qualification respectively. Clinical tuition is provided in the Royal Infirmary and Sick Children's Hospital.

The prospectus of the College, and any information regarding the medical education of women in Edinburgh, may be obtained from the Secretary, Dean's Office, School of Medicine for Women, Surgeons' Hall, Edinburgh.

POST-GRADUATION STUDY.

The different University Laboratories provide facilities for research work. In most cases no fees are charged, but those engaged in research work are expected to defray the expense of materials. The Laboratory of the Royal College of Physicians of Edinburgh is splendidly equipped for the carrying out of all branches of medical research. It is available for research work to Members and Fellows of the Royal Colleges of Edinburgh and to other applicants approved by the Council of the Royal College of Physicians. No fees are charged, and the ordinary reagents, &c., are provided. By arrangement with the Superintendent, workers may have the assistance of members of the Laboratory Staff. Special post-graduate courses may be arranged.

EDINBURGH POST-GRADUATE COURSES IN MEDICINE.

These courses, which are held during the Summer Vacation, are arranged by a Committee appointed by the University and School of the Royal Colleges. The programme for 1912 has not yet been drawn up, but will no doubt be somewhat similar to that for 1911, which was as follows:—

July:—A series of classes dealing for the most part with *Diseases of Children* was arranged for during the last fortnight of the month.

August:—A Four Weeks' Course on *Internal Medicine*. This included series of clinics upon diseases of the various systems, in addition to classes upon Applied Anatomy, Hematology, Bacteriology and the Examination of the Heart, Urine and Digestive Products and Nervous System. Between six and seven hours' instruction daily. Attendance limited to twenty-five. Fee Ten Guineas.

September:—A Four Weeks' *General Course*. Each fortnight was quite independent and might be taken separately. This included Medical and Surgical Clinics, Clinical Neurology, Dermatology, Fevers, Ophthalmology, Pediatrics, Infant Feeding, Applied Anatomy, Morbid Anatomy, Pathological Histology, etc. Fee Five Guineas for the month or Three Guineas for either fortnight. A series of lectures upon Vaccines and Vaccine Therapy and other subjects of general interest was given in connection with the course. These lectures were open to all practitioners.

A Four Weeks' *Surgical Course* included Surgical Clinics, Applied Anatomy,

Surgical Pathology, Operative Surgery, etc. Attendance limited to twenty-five. *Fee* Ten Guineas.

A Course on the *Ear, Nose, and Throat* included classes on the pathology of this subject and operative work in addition to demonstrations on the methods of examination, clinics, etc. *Fee* Ten Guineas.

A *Series of Classes*, the entries for which were limited, upon Hæmatology, Bacteriology, X-Rays, Gynecology, Gynecological Pathology, Ophthalmoscopy, Errors of Refraction, Ear, Nose and Throat, Histological Methods, &c. These classes were open only to those who had entered for the General, Surgical, or Ear, Nose and Throat courses, on payment of an Additional Guinea in each instance.

In addition to these courses the classes throughout the year on Bacteriology, Diseases of the Blood, Diseases of the Tropics, Neurology, &c., are attended by a number of graduates.

Particulars of these classes are to be had from Mr. John Stirton, The New University.

GLASGOW ROYAL INFIRMARY AUTUMN POST-GRADUATE CLASSES.

These include Demonstrations on Diseases and Injuries of the Eye, Surgical Diseases of the Kidneys and Bladder, Clinical Medicine, Clinical Surgery, Diseases of the Ear, Diseases of Throat and Nose, Hæmatology, Gynecology, Practical Pathology and Bacteriology.

Those desirous of attending any of the classes are requested to communicate with Dr. Thom, Superintendent, Royal Infirmary, from whom a syllabus may be obtained.

THE ROYAL NAVY MEDICAL SERVICE.

A CANDIDATE must be between 21 and 28 years of age. He must declare : (1) his age, and date and place of birth ; (2) that he is of pure European descent, the son either of natural-born British subjects or of parents naturalised in the United Kingdom ; (3) that he labours under no mental or constitutional weakness ; (4) that he is ready to engage for general service at home or abroad ; (5) that he is registered under the Medical Acts as duly qualified professionally, and what diplomas, etc., he holds. Copies of the Regulations for the entry of candidates for commissions will be furnished on application to the Medical Director-General, Admiralty, 18 Victoria Street, London, S.W.

The entrance examination consists of two parts. Part I.—*Compulsory* (a) Medicine (including Materia Medica, Therapeutics and Hygiene), 1200 marks ; (b) Surgery and Surgical Anatomy, 1200 marks. A competent knowledge of Operative Surgery is essential. Part II.—*Voluntary*—consisting of two divisions : (a) French and German (300 marks each) ; (b) Natural Sciences—not more than two of the following subjects—Zoology, Botany, Chemistry, Physiology, Geology and Physical Geography (300 marks each).

Successful candidates, immediately after passing this examination, will receive commissions as surgeons in the Royal Navy, and will undergo a course of practical instruction in Naval Hygiene, the Diseases of Warm Climates, etc., at Haslar Hospital.

Full Pay (yearly).—Surgeon (on entry), £255, 10s. ; after four years' full-pay service, £310, 5s. ; after eight years' full-pay service, or on promotion to Staff-surgeon, £363 ; after twelve years' service, £438 ; Fleet-surgeons (on promotion), £492, 15s. ; after four years' full-pay service in that rank, £547, 10s. ; after eight years' full-pay service, £602, 5s. ; after twelve years' service, £657 ; Deputy Inspector-General, £766, 10s. ; Inspector-General, £1300.

Allowances.—The senior medical officer of ships bearing the flag of flag officers commanding foreign stations and the Channel receives an allowance of 5s. a day. An allowance of 2s. 6d. a day may be granted to the senior medical

officer of ships bearing the flag of flag officers not commanding stations or fleets and to ships flying the broad pennant of commodores. Medical officers conducting the course of instruction at Haslar Hospital receive the following allowances :—The two senior officers employed on this duty, £150 a year each ; the junior officer assisting, £50 a year ; the junior officer instructing the sick berth staff, £50 a year. The following charge allowances may be granted to medical officers in charge of hospital ships :—If above the rank of Fleet-surgeons, 5s. a day ; if of the rank of Fleet-surgeon or junior, 3s. 6d. a day. Hospital allowances for naval medical officers at home and abroad, in lieu of provisions for themselves and servants, and for fuel and lights, are as follows :—Deputy Inspector-Generals, at home, £67 ; abroad, £112 ; Fleet or Staff-surgeons, at home, £53 ; abroad, £112 ; Surgeons, at home, £39 ; abroad, £108.

Half Pay (per diem).—Surgeons under two years' full-pay service, 6s. ; after two years' full-pay service, 7s. ; after four years' full-pay service, 8s. ; after six years, 9s. ; after eight years, 10s. ; after ten years, 11s. Staff-surgeon on promotion, 12s. ; after fourteen years, 13s. ; after sixteen years, and on promotion to Fleet-surgeon, 14s. ; after eighteen years, 15s. ; after twenty years, 17s. ; after twenty-two years, 18s. ; and after twenty-four years, 20s. Deputy Inspector-General on promotion, 25s. ; after two years' full-pay service in rank, 27s. ; after four years, 29s. Inspector-General, 38s.

Every medical officer will be required to undergo a post-graduate course of three months' duration at a metropolitan hospital once in every eight years. While carrying out this course, he will be borne on a ship's book for full pay and will be granted lodging and provision allowances and travelling expenses. The fees for each course (not exceeding £25) will be paid by the Admiralty. The medical officer will be required to produce separate certificates of efficient attendance in (1) the medical and surgical practice of the hospital ; (2) a course of operative surgery on the dead body ; (3) a course of bacteriology ; (4) a course of ophthalmic surgery, particular attention being paid to the diagnosis of errors of refraction ; (5) a practical course of skiagraphy.

ROYAL ARMY MEDICAL CORPS.

The conditions of service are as follows :—

A candidate for a commission must be 21 years of age, and not over 28 years of age, at the date of commencement of the entrance examination. He must possess a registrable qualification to practise. Regulations, forms of application, and declaration may be obtained on application to the Director-General, Army Medical Service, 68 Victoria Street, London, S.W. The Dean of the candidate's medical school will be requested to render a confidential report as to the candidate's character, conduct, professional ability and fitness, and to this report special importance will be attached. The candidate may subsequently be allowed to compete for a commission, having been previously examined as to physical fitness by a Medical Board.

The *Entrance Examination* (held twice a year, usually in January and July) is of a clinical and practical character, partly written, and partly oral, marks being allotted under the following scheme :—

MEDICINE (written).		Maximum Marks.
A. Examination and report upon a medical case in the wards of a hospital		125
B. Commentary upon a case in medicine		125
MEDICINE (oral).		
A. Clinical cases ; clinical pathology		75
B. Morbid anatomy and morbid histology		75

SURGERY (written).

A. Examination and report upon a surgical case in the wards of a hospital	125
B. Commentary upon a case in surgery	25

SURGERY (oral).

A. Clinical cases, including diseases of the eye; surgical instruments and appliances	75
B. Operative surgery and surgical anatomy	75
Total marks	<u>800</u>

Having gained a place in this entrance examination, the successful candidates will undergo two months' instruction in hygiene and bacteriology, after which they will be examined in these subjects. On completion of this course lieutenants on probation will proceed to the Depot of the Royal Army Medical Corps at Aldershot for a three months' course of instruction in the technical duties of the Corps, and at the end of the course will be examined in the subjects taught.

EXAMINATIONS FOR PROMOTION.

Lieutenant before promotion to Captain (for Lieutenants appointed after 31st March 1901). This examination may be taken at any time after completing eighteen months' service. The subjects of the examination are: (1) Regimental duties; (2) drill; (3) military law; (4) duties and accounts connected with military hospitals and their supplies; (5) other duties of executive medical officers.

Captains before promotion to Majors (for Captains promoted to that rank after 27th July 1895). This examination may be taken at any time after completing five years' service, after terminating a period of special study. The subjects of the examination are: medicine, including specific fevers, surgery, including skiagraphy, hygiene, bacteriology, and tropical diseases, and one special subject from the subjoined list, to which additions may from time to time be made—bacteriology (including the preparation of antitoxins), dental surgery, dermatology, midwifery and gynaecology, advanced operative surgery, ophthalmology, otology, including laryngology and rhinology, psychological medicine, State medicine.

Majors for promotion to Lieutenant-Colonel (for Majors promoted to that rank after 31st March 1895). This examination may be taken at any time after three years in the rank of Major. The subjects of this examination are: (1) Military law; (2) army medical organisation; (3) sanitation of towns, camps, transports, &c., epidemiology and the management of epidemics; (4) the laws and customs of war in relation to the sick and wounded; (5) one special subject, *e.g.* (a) medical history of important campaigns; (b) a general knowledge of the army medical services of other powers.

PAY.

<i>At Headquarters.</i>		Inclusive of all allowances except field and travelling allowances.
		Yearly.
Director-General		£2000
Deputy Director-General		1500
Assistant Director-General		850
Deputy Assistant Director-General		750
<i>At other Stations.</i>		Exclusive of allowances.
		Daily.
		£ s. d.
Surgeon-General		3 0 0
Colonel		2 0 0

	Exclusive of allowances. Daily.
	<i>£ s. d.</i>
Lieutenant-Colonel	1 10 0
" " specially selected for increased pay after at least 8 years' service abroad	1 15 0
Major	1 3 6
Major after 3 years' service as such	1 6 0
Captain	0 15 6
" after 7 years' total full-pay service	0 17 0
" " 10 " " "	1 1 0
Lieutenant on probation and Lieutenant	0 14 0
Adjutant of the Royal Army Medical Corps (Volunteer) the pay of his rank.	

Additional Pay.

Officer not serving on the Headquarters' Staff appointed a member of the Advisory Board	£150 a year.
Officer serving as Secretary of the Advisory Board and Nursing Staff	£100 a year.
Officer under the rank of Lieutenant-Colonel holding an appointment as Specialist	2s. 6d. daily.
Quarter-Master in charge of Medical Stores at Woolwich	2s. 6d. daily.

Charge Pay.

(a) Officer in charge of a general or other hospital, or of a division of a general hospital—	Daily.
If in charge of at least 50 beds	s. d. 2 6
" " " 100 "	5 0
" " " 200 "	7 6
" " " 300 "	10 0
(b) Officer in command of the Depot, Royal Army Medical Corps	5 0

Retired Pay.

Director-General (after three years' service in the appointment, and 30 years' service)	Yearly. £1125 Daily.
Surgeon-General	£ 2 0 0
Colonel	1 15 0
Lieutenant-Colonel, or Surgeon-Lieutenant-Colonel of the Household Troops—	
After 20 years' service	1 0 0
" 25 " "	1 2 6
" 30 " "	1 5 0
Lieutenant-Colonel, after having been in receipt of the increased pay (5s. a day) for 3 years; or Brigade-Surgeon-Lieutenant-Colonel of the Household Troops—	
Under 30 years' service	1 7 6
After 30 " "	1 10 0
Major, or Surgeon-Major of the Household Troops—	
After 20 years' service	1 0 0
After 25 years' service, if his service reckoning for promotion is insufficient to qualify him for promotion to the rank of Lieutenant-Colonel	1 2 6
Major or Captain—	Gratuity.
After 5 years' service in the rank of Captain	£1000
After 10 years' service, if the officer was commissioned before the date of the Warrant	1250
After 3 years' service in the rank of Major	1800
" 6 " "	2500

from the rank of Colonel to that of Surgeon-General are given by selection for ability and merit.

PAY.

The following are the monthly rates of Indian pay drawn by Officers of the Indian Medical Service from the date of their arrival in India :—

Rank.	Unemployed Pay.	Grade Pay.	Staff Pay.	In Officiating Medical Charge of a Regiment.	In Permanent Medical Charge of a Regiment.
	Rs.	Rs.	Rs.	Rs.	Rs.
Lieutenant	420	350	150	425	500
Captain	475	400	150	425	550
„ after 5 years' service	475	450	150	545	600
„ after 7 years' service	—	500	150	575	650
„ after 10 years' service	—	550	150	625	700
Major	—	650	150	725	800
„ after 15 years' service	—	750	150	825	900
Lieutenant-Colonel	—	900	350	1075	1250
„ „ after 25 years' service	—	900	400	1100	1300
Lieutenant-Colonel specially selected for increased pay	—	1000	400	1200	1400

The principal administrative appointments are held by Colonels and Surgeon-Generals on the following consolidated salaries :—

Colonels, from Rs. 1800 to Rs. 2250 per mensem.

Surgeon-General 2 @ Rs. 2200 „

„ 2 @ Rs. 2500 „

„ 1 @ Rs. 3000 „

Specialist pay at the rate of Rs. 60 a month is granted to officers below the rank of Lieutenant-Colonel who may be appointed to certain posts.

The salaries of other substantive medical appointments in the Civil and Military Departments are consolidated, and vary from Rs. 400 to Rs. 1800 per annum.

Qualified Officers of the Medical Service are also eligible for appointments in the Assay Department. The salaries of these appointments are from Rs. 600 to Rs. 2250 per mensem.

Officers are required to perform two years' regimental duty in India before they can be considered eligible for civil employment.

Except in the administrative grades, and in certain special appointments, medical officers are not debarred from taking private practice. No officer, however employed, can receive any staff allowance unless he has passed the examination in Hindustani known as the "Lower Standard."

Retiring Pensions and Half-Pay.

Officers of the Indian Medical Service may retire on the following scale of pension :—

	Per Annum.
After 30 years' service for pension	£700
„ 25 „ „ „	500
„ 20 „ „ „	400
„ 17 „ „ „	300

All officers of the rank of Lieutenant-Colonel and Major are placed on the Retired List when they have attained the age of 55 years, and all Surgeon-Generals and Colonels when they have attained the age of 60 years.

Officers placed on temporary or permanent half-pay are granted the British rate of half-pay of their military rank as under :—

RANK.	RATES OF HALF-PAY.					
	Per Diem.		Per Annum.			
	s.	d.	£	s.	d.	
Lieutenant-Colonel	11	0	200	15	0	
Major	9	6	173	7	6	
Captain	7	0	127	15	0	
Lieutenant	3	0	54	15	0	

MEDICAL APPOINTMENTS IN THE COLONIES.

APPLICANTS for medical appointments in British Guiana, Jamaica, Trinidad and Tobago, Windward Islands, Leeward Islands, British Honduras, Fiji, Ceylon, Straits Settlements, Sierra Leone, Gambia, Gold Coast, Lagos, Northern and Southern Nigeria, Malay States, Hong Kong, Mauritius, Seychelles, Gibraltar, Cyprus, St. Helena and the Falkland Islands, must be between 23 and 30 years of age, must be doubly qualified, and preference will be shown towards those who have held resident hospital appointments. Applications for medical appointments should be sent to the Assistant Private Secretary, Colonial Office.

Information regarding medical appointments in Cape Colony and Natal can be obtained on application to the Agent-General to the Cape, 100 Victoria Street, London, S.W., and the Agent-General for Natal, 26 Victoria Street, London, S.W.

Medical appointments in Rhodesia are made by the British South Africa Company, 2 London Wall Buildings, E.C. ; those in the Transvaal and Orange River Colonies are made on the recommendation of the Governors of these Colonies.

OBITUARY.

JAMES ANDREW, M.D., F.R.C.P.

DR. ANDREW was compelled several years ago by ill-health to give up the active practice of his profession, and of late was increasingly less able to go among his old friends and associates. He came of a good old Scottish family. His grandfather, the Rev. James Andrew, LL.D., was born and educated in Aberdeen, and was chaplain to the Grants of Monymusk at a time when Episcopacy in Scotland was rather under a cloud. Later he was Principal of the East India Company's Military Seminary at Addiscombe, and died in 1833. A notice of his life appears in the *National Dictionary of Biography*, from which it appears that he established a private academy at Addiscombe, which acquired so high a reputation that the East India Company chose it for the education of their engineer and artillery pupils. Andrew's father, another Dr. James Andrew, was educated at Cambridge, settled in Edinburgh, built up a large practice in his day, and was greatly respected. His wife, James Andrew's mother, was Eliza Reid, belonging to a well-known Edinburgh family. Andrew was born in 1844, in his maternal grandfather's house in Minto Street. He was educated at the Edinburgh Academy, where he was a member of one of "Weir's" classes, studied medicine at the Edinburgh University, and took his degree in 1866. In that year he was Resident Physician with Dr. Haldane. Four years later he became a Fellow of the Royal College of Physicians. For many years Dr. Andrew carried on a large and important practice, and was greatly liked and trusted by all who came in contact with him. He was not a man of many friendships, but was staunch to those whom he trusted, especially his old school-fellows. His old friend, James Dunsmore, now also dead, was in the same class with him at school. They studied medicine together, and were Presidents of their respective Colleges in the same year. At the annual dinner of the College of Surgeons, when it fell to Andrew to propose the health of the President, James Dunsmore replied in terms of great feeling, referring to their life-long friendship and the old school-days: "We were at the Academy together."

Dr. Andrew held many public appointments. He was Physician to the Royal Public Dispensary, and it is only right that a tribute should be given in passing to the deep interest which both he and his father took in that institution. The annals of the Dispensary testify to the work which father and son did for its welfare. He was for many years Physician to the Royal Hospital for Sick Children, and for five years was one of the Managers of the Royal Infirmary. He

was a member of the Council of the Scottish Branch of the Queen Victoria Institute for Nurses, and was examiner to the Royal College of Physicians and a University Lecturer on the Diseases of Children. Into all these undertakings he entered with much enthusiasm, and showed good judgment and common sense. But above all these he appreciated his election in 1898 to the Presidency of the Royal College of Physicians. He had not taken a very active part in College affairs, and his selection came to some as something of a surprise. But he made a most dignified and successful President, and was unanimously re-elected in 1899. There is something sentimentally pathetic in the fact that by his express directions he was buried in his College gown.

Like his father and grandfather before him, he was an Episcopalian, and was one of the oldest members of St. Paul's Church in York Place, where for many years he was a member of the vestry.

His wife, a daughter of Walter Haigh of Scarborough, died some seven years ago.

Andrew was a keen fisher and was well known in many of the haunts dear to the votaries of the craft, and he was one of the old whist players who never forgave bridge.

A. S. C.

RECENT LITERATURE.

CRITICAL SUMMARIES AND ABSTRACTS.

MEDICINE.

By JOHN D. COMRIE, M.A., B.Sc., M.D., F.R.C.P.,
Lecturer on the History of Medicine, University of Edinburgh.

RECENT WORK ON DIABETES.

ALTHOUGH much research has been made after some treatment which would be of the nature of a specific for this common and fatal disease, but without a great degree of success, our knowledge of the conditions underlying and surrounding diabetes has undoubtedly advanced greatly in recent years. The failure to find one mode of treatment applicable to all cases, and the fact that some cases do well upon a line of treatment which is useless or even hurtful to other cases, has led to the doubt whether diabetes mellitus is to be regarded as one disease or whether the output of sugar in pathological amount should not rather be considered simply as a symptom common to several morbid processes. This polymorphism in the nature of diabetes is still further supported by the varying results of experimental work.

Magnus Levy in his Cartwright Lectures, delivered before the New

York Academy of Medicine,¹ discusses this question fully. While the pancreas is still held to be mainly and usually responsible for this metabolic error, a number of other organs are at the present day believed to play a part with it. Sugar is eliminated mainly by the kidneys, but while these organs are sometimes responsible, for example in experimental phloridzin glycosuria and perhaps occasionally in alimentary glycosuria, renal diabetes must be regarded as very rare. The liver is now considered to be merely a passive factor in diabetes, despite the labours of Claude Bernard about 1854-55 in demonstrating the function by which glycogen is converted in the liver into sugar. As regards the theory of Falta² and others that the pancreas, thyroid, and adrenals form a system, connected either by nervous influences or by hormone bodies in the circulation, with the pancreas acting in opposition to the other glands, Magnus Levy holds that there is not as yet sufficient proof. He favours the idea that the essential nature of diabetes in most cases is a diminished sugar combustion—not an excess of formation—and that the elucidation of the problem is probably to be sought in the relation between the glandular hormones and the muscles.

Arany³ advances a novel theory to account for the phenomena, which is, however, unsupported by the other facts we know of diabetes. As the amount of sugar in the blood during health never rises over a certain amount, no matter how much carbohydrate is ingested—being stored up in the liver as glycogen and leaving it again in this form to be reconverted into sugar, according to the requirements of the energy-producing tissues—it may be assumed that some inactive ferment is at work under the influence of an activating substance. This activating substance Arany believes to be formed by the intestinal bacteria, thus attributing one more metabolic disorder to altered conditions of growth in the flora of the alimentary tract. Wynhausen⁴ reported the result of some studies made by him upon the amount of diastatic ferment in the blood in cases of diabetes. He examined 88 cases, of which 31 were diabetics. Even in health the amount of the ferment in some cases was ten times its amount in others, while in the diabetic cases the fluctuation was almost, though not quite, so great. From this the writer concluded that the amount or strength of this ferment in the blood bore no relation to the presence of diabetes. Indeed the ferment in individual cases examined appeared to diminish as the sugar in the urine increased. Further, there appeared to be no relation between the ferment and the amount of acidosis.

METABOLISM IN DIABETES.

In one of a series of papers on "Diabetes" read before a meeting of the American Medical Association, Lusk⁵ publishes some studies upon

the protein and fat metabolism in this disease. Dealing with one particular case of diabetes, he found that on a purely meat and fat diet for every gramme of nitrogen appearing in the urine there were 3.65 grms. of dextrose. As 1 gm. of nitrogen is equivalent on an average to 6.25 grms. of protein, this means that in diabetes protein yields nearly two-thirds of itself as sugar (3.65: 6.25). This relationship was constant no matter how much protein was administered, and was quite independent of the amount of fat ingested. The writer expresses his disbelief in the fact alleged by many that sugar is capable of being formed from fat, while the breaking up of the protein molecule gives rise to organic acids, which in turn are conveyed to the liver and there converted into dextrose.

He enters a diatribe against the practice of estimating the severity in a case of diabetes by the percentage of sugar present in the urine, which he considers equally futile with estimating the number of grains of urea per ounce of urine, where the intake of carbohydrate in the former case and of protein in the latter is unknown. To estimate the intensity of a case of diabetes he holds that we must know three things—(1) the total output of dextrose, (2) the total intake of carbohydrates, and (3) the possible maximum of sugar derived from proteins, which is obtained by multiplying the number of grammes of urine nitrogen by 3.65. Then we have:—

Output of dextrose in grammes

Grammes of urine N \times 3.65 + grammes of food dextrose, _____

a formula by which we recognise the fact that the output of dextrose is dependent both upon the amount of carbohydrate ingested and also upon the degree of protein metabolism. Multiplied by 100 this figure gives the percentage of sugar eliminated, or Falta's "co-efficient of excretion."

By this means an idea is got of the proportion of carbohydrate which may safely be allowed to the diabetic. Quite apart from consideration of the palate, the work of Benedict and Joslin⁶ has shown that the heat production of the diabetic is raised, sometimes by 15 per cent. above normal, and it is therefore highly important to supply him with a large quantity of heat-producing food. The patient must receive at least the 35 calories per kilo normally required; protein in reasonable amount will not supply more than 10 to 15 per cent. of this; fat in large amount becomes difficult of digestion, and hence one reason for the desirability of as much carbohydrate as the patient's metabolism will tolerate.

ANTI-KETOGENESIS.

Another reason for supplying the diabetic with carbohydrate is found in the tendency to acidosis. Theoretically beta-oxybutyric

acid with diacetic acid and acetone may be formed either from protein or fat molecules, when the power of oxidation of these is curtailed as well as that of sugar. Ammonia is taken, as also alkali, from the tissues to neutralise these acids, and the amount of these bases present in the urine rises markedly. While the normal amount of ammonia in the urine is not over 1 grm. daily, this may rise, according to Klein and Moritz,⁷ to 2, 6, or even 12 grms. in the diabetic threatened with acidosis. The presence of certain substances which interact with acetone (ketone) and its congeners to reduce them is therefore beneficial, and this principle is known as antiketogenesis. Among these substances stands sugar, which in the course of oxidation has a strongly antiketogenic action. Hence another reason for the desirability of its administration in quantities that can be utilised. Ciamician and Silber⁸ found that when alcohol was mixed with various ketone bodies and exposed to strong sunlight *in vitro* the alcohol was oxidised and the ketone bodies reduced. It may be, therefore, that alcohol is really of value in the body in preventing acidosis, as recommended some years ago by Neubauer⁹ from clinical experience. This substance is also used by von Noorden in his clinic in amounts up to 50 c.c. per diem. Two other substances have been tentatively tried by Woodyatt,¹⁰ viz. glycol aldehyd and glycerin aldehyd, which he found to be possessed of antiketogenic properties, but at the same time to cause the appearance of much less sugar in the urine than the administration of an equal quantity of glucose. An important problem still to be solved regarding diabetes is the discovery of some substance which will be powerfully antiketogenic and still not cause increased glycosuria.

SPECIFIC TREATMENT OF DIABETES.

The treatment by duodenal extract, which was introduced some years ago in consequence of the investigations of Moore and Abram,¹¹ who failed to find prosecretin in the duodenal mucous membrane of diabetics, has now fallen largely into desuetude. They prepared an acid extract of duodenal mucous membrane (secretin), which they administered to patients in the expectation of thereby stimulating the flagging activity of the pancreas. Their results have not been verified by other observers either as regards the absence of the duodenal ferment in diabetes or the success attending its administration. Similar disappointment has attended the treatment by pancreatic extracts. Rennie and Fraser¹² prepared an extract from the islands of Langerhans in certain fish which have this part of the pancreatic tissue collected into a mass visible to the naked eye, and later Zuelzer¹³ believed that he obtained success with an

extract made from dog's pancreas removed during the height of digestion. All these pancreatic methods of treatment in the hands of other observers have proved disappointing. This is not to be wondered at when we consider that Cecil¹¹ found the pancreas affected in only 50 per cent. of cases of diabetics under 30 years of age. Still, in view of the close relation shown by the experimental method to subsist between total removal of the pancreas or its complete separation from the duodenum and the onset of glycosuria, these forms of treatment might still be tried in cases where the pancreas is obviously at fault.

Rudisch¹⁵ recommended strongly the use of atropin in diabetes. Probably this acts on the same principle of slowing metabolism, especially that part transacted in the liver, as did the older treatment by opium and codeine. Wallace¹⁶ found in experiments upon a series of depancreatized dogs with artificial glycosuria that this mode of treatment had no effect whatever.

With regard to diet, the oatmeal treatment of von Noorden still holds its own as the most suitable shape in which to give carbohydrate. Flour made from the soy bean is recommended by Friedenwald and Ruhrah¹⁷ because of the extremely low carbohydrate content of this legume, of which the composition is, water 10 per cent., protein 35 per cent., fat 17 per cent., starch 5 to 6 per cent.

REFERENCES.—¹ Magnus Levy, *Medical Record*, Nos. 21, 22, 23, 1910. ² Falta, *Prag. med. Wochenschr.*, No. 7, 1910. ³ Arany, *Zentralbl. f. Inn. Med.*, No. 30, 1910. ⁴ Wynhausen, *Berlin. klin. Wochenschr.*, No. 46, p. 2107, 1910. ⁵ Lusk, *Journ. of Amer. Med. Assoc.*, vol. lv. No. 25, 1910. ⁶ Benedict and Joslin, *Progressive Medicine*, p. 324, June 1911. ⁷ Klein and Moritz, *Deut. Archiv. f. klin. Med.*, vol. xcix. p. 162, 1910. ⁸ Ciamician and Silber, *Journ. of Amer. Med. Assoc.*, vol. lv. No. 25, p. 2111, 1910. ⁹ Neubauer, *Muench. med. Wochenschr.*, vol. lviii. p. 791, 1906. ¹⁰ Woodyatt, *Journ. of Amer. Med. Assoc.*, loc. cit., p. 2110. ¹¹ Moore and Abram, *Biochem. Journ.*, vol. i. p. 28, 1906. ¹² Rennie and Fraser, *Ibid.*, vol. ii. p. 7, 1907. ¹³ Zuelzer, *Zeitschr. f. exper. Path. u. Ther.*, vol. v. p. 6, 1908. ¹⁴ Cecil, *Journ. Exper. Med.*, vol. xi. p. 266, 1909. ¹⁵ Rudisch, *Journ. of Amer. Med. Assoc.*, p. 1366, 1909. ¹⁶ Wallace, *Ibid.*, p. 2108, 1910. ¹⁷ Friedenwald and Ruhrah, *Amer. Journ. of Med. Sci.*, December 1910.

SURGERY.

By JAMES LOCHHEAD, M.D., F.R.C.S.

PERITONEAL ADHESIONS, AND THE TREATMENT OF DENUDED BOWEL.

THE literature on the etiology, pathology, prevention, and treatment of peritoneal adhesions has now become so voluminous that a critical

survey of it is of value. Such is given by E. H. Richardson, who at the same time suggests a new method of treating denuded bowel surfaces (*Johns Hopkins Hosp. Bull.*, August 1911). The area of the peritoneum is almost as great as that of the skin, and in all probability its epithelial surface is continuous, and not, as is generally taught, interrupted by stomata leading into the lymphatic channels. At the same time it has remarkable absorptive power, especially on the under surface of the diaphragm and on the omentum. Fluids and soluble substances are, for the most part, absorbed by the blood-vessels, while solid particles, including bacteria and oil globules, are taken up by the lymphatics. Closely allied with its absorptive qualities is its ability successfully to cope with a large amount of infection without suffering serious or permanent damage. The visceral peritoneum is insensitive, but the parietal layer is exquisitely sensitive to painful stimuli.

One of the most striking characteristics is the rapidity with which the peritoneum can form adhesions. During an operation, gauze may become snugly fixed to a visceral surface within twenty minutes. Further, the peritoneum may completely absorb adhesions. The sequence of events in the formation of adhesions is—Injury or death of the endothelium, pouring out of coagulable exudate, agglutination, organisation, fibrous tissue formation, and, finally, a contracted scar. It has been suggested that the permanence or subsequent resolution of adhesions depends on the fate of the surface endothelium. If the cells recover from the injury sustained at an operation, the pathological process advances no further than agglutination, and later all trace of the exudate is lost; if the endothelium dies, organisation proceeds, and permanent adhesions are established. Of the many substances considered inimical to the vitality of the endothelium, Richardson thinks that blood, ligatures and sutures, and the eschar of the thermo-cautery are not of much account, while exposure to the air, infection, and denudation of the peritoneal surface by rough handling or otherwise are all capable of producing adhesions. For the prevention of their formation, the obvious measures are rigid asepsis, avoidance of trauma, careful covering of all visceral surfaces, and the use of hot, moist gauze. In spite of these precautions, troublesome and dangerous adhesions may form, and numerous devices have been adopted with the hope of successfully preventing adhesions in all cases. Such non-absorbable protective membranes as collodion film, gelatin-formalin coagulum, lymph-aristol-coagulum, solution of gutta-percha in chloroform, xylol and thin sheets of rubber fabric have been tried, but are not to be recommended. Physostigmin has been largely used after operation to stimulate strong peristalsis, and thus liberate early adhesions, but the recorded results have been conflicting. Specific drugs, such as potassium iodide and fibrolysin, have been tried, and some hopeful results have been obtained from the use of anti-fibrin ferments to prevent the coagulation of exuded

serum. Normal saline solution in large quantity has been introduced at operation to keep denuded bowel surfaces apart, and, later, adrenalin was added to constrict the vessels and lessen the exudation of serum. But it has been shown that the fluid is absorbed long before the endothelium has grown over the raw surfaces. More recently distension of the cavity with oxygen just before the closure of the peritoneum and the induction of abdominal hyperæmia by repeated applications of hot air-baths have been advocated. Various lubricants, such as olive oil, vaselin oil, and liquid lanolin, are extensively used. Of animal membranes the best known are Cargile's membrane, made from the peritoneum of the ox; gold-beaters' skin, derived from the outer coat of the cæcum of the ox; and a finely woven cloth of catgut. The Cargile membrane, which has been most widely used, has frequently given unfavourable results. Such membranes constitute a foreign body, and theoretically ought to provoke rather than prevent adhesions. The attempts to cover raw surfaces with viable grafts of peritoneum or omentum are much more rational. A separated piece of omentum grafted on intestine is vascularised within twenty-four hours, but it does not prevent adhesions except when applied to the abdominal parietes and to organs possessing strong peristalsis, such as the stomach and urinary bladder. When applied to the small intestine to cover a weak point or reinforce a suture line, it invariably adheres to neighbouring loops.

Richardson proposes to use the adjacent mesentery for covering denuded surfaces. In the cases in which there is a considerable deposit of fat in the mesentery he incises one leaf about a third of an inch from the bowel, inserts a spatula and separates a flap of the required breadth, then pulls it up over the raw surface, and fastens it in position with one or two interrupted sutures. In poorly nourished patients with little or no fat he simply lifts a fold of the whole mesentery over the denuded area. He states that the method is applicable to all parts of the bowel that possess a long mesentery. The slight spiral rotation of the loop has no demonstrable effect in obstructing its lumen, and if the sutures are inserted so as to escape the larger vessels, the mesenteric circulation is not interfered with. The method can be safely used for denuded areas which extend over half the circumference and three or four inches in length, and it may be repeated as often as necessary.

FÖRSTER'S OPERATION IN THE GASTRIC CRISES OF TABES AND IN OTHER CONDITIONS.

The gastric crises of tabes owe their origin to the hyperæsthesia of the gastric mucous membrane. The affected nerve fibres run from the mucosa to the solar plexus, traverse the semilunar ganglion, and by way of the splanchnic nerves reach the posterior roots of the seventh, eighth, ninth, and tenth dorsal nerves on either side. Förster's

operation consists in opening the spinal dura mater and resecting several millimetres of each of these posterior roots. The technic is thus described by v. Pauchet (*Ann. Internat. de Chir. Gastro-intest.*, January to April 1911):—The patient is laid prone on a sloped table so that the head is lowest. To render the vertebræ more prominent, a cushion is placed under the upper part of the abdomen. The surgeon marks the fifth and eighth dorsal spines, the former corresponding to the seventh nerve-root and the latter to the tenth. The incision runs from the fourth to the ninth dorsal spine, and the vertebræ are cleared with a periosteum separator as far as the costo-vertebral articulations on each side. The spinal canal is then opened as in laminectomy along the whole length of the wound, the dura is incised mesially, and the edges are retracted by two sutures inserted on either side. With a blunt strabismus hook the operator identifies and picks up the posterior roots near the middle line, and follows them to their point of emergence through the dura. Each is in turn resected, and the section is sometimes accompanied by respiratory and circulatory difficulties. These dangerous reflexes may be suppressed by injecting novocain into the nerve-roots before they are divided. The dura is closed with catgut and the wound closed in layers without drainage. The patient is laid on his face or his side in bed, but not on his back, for several days, and he is allowed up as soon as the wound is healed. To prevent the escape of cerebro-spinal fluid and lessen the risk of infection some surgeons recommend extra-dural resection of the posterior roots.

As the result of the operation the gastric pain and vomiting disappear at once, and the patient is again able to take food.

Förster's operation has also been performed with good results in forty cases of Little's disease (spastic diplegia of infants) and in spastic paralysis from other causes—Pott's disease, traumatic paraplegia, cerebral paraplegia, arm contracture of cerebral origin, athetosis, and hydrocephalus. Slight benefit has been observed in some cases of hemiplegia, cerebral syphilis, and lateral sclerosis. In multiple sclerosis the results have for the most part been unfavourable.

Other recent papers on the subject are those of Leriche and Cotte (*Journ. de Chir.*, May 1911) and Stiefler (*Wien. klin. Wochenschr.*, 10th August 1911), the latter including a comprehensive bibliography.

ANÆSTHESIA WITH EXCLUSION OF THE LIMB CIRCULATION.

Klapp first suggested that the dangers of general anæsthesia might be lessened by excluding the blood of the four limbs during the narcosis. The exclusion is obtained by applying elastic bands to the root of the limbs with sufficient tightness to arrest at once the arterial and venous circulations. The blood and tissue fluids of the extremi-

ties are not charged with the anæsthetic and when, at the end of the operation, the bands are loosened, absorb a proportion of the anæsthetic and so increase its dilution.

The method has received an extended trial in 1144 cases with chloroform and 35 with ether at the hands of H. Délagenière (*Bull. de l'Acad. de Médéc.*, 25th July 1911), and his conclusions are highly favourable—anaesthesia is more rapidly induced, usually in about five minutes, and the amount of chloroform required is reduced by one-half. The patient also “comes out” sooner after the operation. Post-anæsthetic complications—vomiting, jaundice, albuminuria—are diminished in frequency and in degree. Respiratory syncope can be at once effectively treated by releasing one or more of the bands. The blood entering from the limbs contains a high percentage of carbonic acid which stimulates the respiratory centre. The disadvantages are unimportant—tingling of the limbs for some hours, small ecchymoses, sometimes transient numbness or paresis, possibly a slightly greater tendency to phlebitis in the lower extremities. The only contra-indications are some cases of myocarditis, vascular lesions, and general infections. The method is specially to be commended in all renal and liver affections, and, above all, alcoholism.

ARTHROPLASTY.

R. B. Osgood reports three cases of ankylosis, each of some years' duration, in which the reunion of bone was prevented by the interposition of Baer's membrane (*Boston Med. and Surg. Journ.*, 20th July 1911). This is a tough membrane obtained from the bladder of the pig, sterilised and chromicised like catgut, and it is supposed to resist absorption in the tissues for at least thirty days. In reality it has been found unabsorbed and strong at the end of eleven weeks. In seven cases observed by Osgood there was a serous or slightly purulent discharge from some part of the wound, appearing from three days to four weeks after the operation, but many of Baer's cases showed no discharge. The insertion of the membrane is followed by a rise of temperature for a day or two, this being probably due to the chemical action of chromic acid.

Three cases are reported in detail by Osgood—ankylosis of the lower jaw, ankylosis of the knee in a flexed position, and ankylosis of the elbow in extension. In the first case the condyle was excised and the end of the ramus rounded. The membrane was then wrapped round and retained by catgut sutures. Opening of the jaw to the extent of an inch was obtained, and the movement was permanently retained, although the membrane had to be removed after some weeks of discharge from the wound. In the case of the elbow, complete extension, flexion to less than a right angle, and a slight degree of pronation and supination were obtained.

SIMILARITY BETWEEN HÆMATOCELE AND EARLY MALIGNANT
DISEASE OF THE TESTIS.

The resemblance between early malignant disease of the testis and an old hæmatocele may be so close as to defy the usual methods of examination. In both conditions there is a tumour in which the details of the testis are obliterated, there may be an indefinite sense of fluctuation with variations in consistency, translucency is absent, and a history of injury is the rule. The cord may be normal, or, even in simple hæmatocele, it may be slightly thickened. From a consideration of these points, Woolfenden urges that operation should be at once performed in all cases of malignant testicle, though the signs are still doubtful and resemble those of hæmatocele, and in all apparent hæmatoceles with thickened walls, in the fear that malignant disease may be present (*Med. Rev.*, August 1911). Even at the operation, when the testicle in the tunica vaginalis has been delivered, it is often impossible without incision of the tunica to determine which of the two conditions is present. Three cases are quoted to illustrate the difficulties, especially when a distinct history of accident is obtained. In one a diagnosis of hæmatocele was made by several surgeons, yet the tunica vaginalis was found normal in thickness and to contain only a few drops of clear fluid, while the testicle was the seat of a chondro-sarcoma. The accident may have caused an increase in the rate of growth, or merely drawn the patient's attention to the swelling.

OBSTETRICS AND GYNECOLOGY.

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TREATMENT OF INOPERABLE CANCER OF THE CERVIX.

IN an address to the International Congress of Obstetrics and Gynecology, Bétrix (*La Gynécologie*, June 1911) puts forward a strong plea for a more careful and thorough treatment of cases of cancer of the cervix too advanced for the radical operation. Since the abdominal operation by Wertheim's method has been adopted, the proportion of cases available for the radical operation has greatly increased, but there still remain about 40 or 50 per cent. in which any attempt at complete extirpation of the uterus would be hopeless by reason of the involvement of the vaginal walls, bladder, rectum, or pelvic connective tissue. In such cases it has too frequently been the practice for

gynecologists to order deodorant douches and morphia and do nothing more, or perhaps to curette the diseased cervix and apply some caustic. Bétrix points out that in a fair proportion of such cases life can be considerably prolonged and, in a few instances, the disease totally eradicated if a proper line of treatment be followed. The aim of all treatment in such cases should be the thorough destruction of the cancerous tissue, and not merely the amelioration of such symptoms as hæmorrhage, fœtid discharge, and pain.

The treatment which he along with others has found most effective is by the actual cautery, with or without a previous curettage of the diseased area. Curettage without cauterisation ought to be totally abandoned, as it has been found in many cases that the extension of the disease after it has been very rapid, especially in young women, due probably to the opening up of lymphatics. His method is as follow:—The patient has a general anæsthetic and the mass of cancerous tissue is scraped away with a curette until hard healthy tissue is reached. Care must of course be taken not to injure bowel or bladder. The hæmorrhage is free and the scraping must be done rapidly. The cautery is then applied at a red heat, first to the areas which are bleeding most, and then all over the cavity. He prefers the actual cautery to the Paquelin, as its action is deeper and more certain. Different sizes are required, the smaller ones being used to reach the depressions.

The cavity and vagina are then plugged with dry gauze, on which bismuth and tannic acid may be applied. The author lays great stress on the gauze being dry. It is left in for three or four days and then renewed. Chemical caustics such as nitric acid, chloride of zinc, or tincture of iodine can be applied to the cavity if necessary a fortnight after the curetting. As a rule they are not necessary. The slough is usually cast off in from twelve to fourteen days. At this time there may be a slight elevation of temperature. The immediate results are good and parametric infiltrations often clear up. As regards permanent cure, this is more frequent in cervical canal cancer than in that affecting the vaginal aspect. Fraenkel reports seven cases of cure out of fifty operated on, and others, such as Sims, Prochownik, Czerny, and Chrobak, have recorded permanent cures. It should therefore be more widely recognised that the treatment of these advanced cases of cancer is by no means so hopeless as the majority of men are inclined to think.

CLINICAL VARIETIES AND TREATMENT OF PUERPERAL INFECTION.

Harrar, in the *Bulletin of the Lying-in Hospital of the City of New York*, March 1911, gives the statistics of the septic cases treated during the past six years and the conclusions he has come to regarding the recognition and treatment of the different varieties of puerperal infec-

tion. Their standard of morbidity is a temperature of 100.4° , and during the six years 825 cases were classed as "morbid." In all cases where the temperature and pulse continued elevated, smears were taken from the cervix and interior of the uterus. In 225 cases organisms were found, but in all there were 317 cases in which the temperature was definitely bacterial in origin, although in many instances it was largely sapremic. Streptococci, staphylococci, and gonococci were found in about an equal number of cases, and the colon bacillus in half that number.

As regards gonococcal infection, Harrar points out that he found the gonococcus in smears from the cervix in about 6 per cent. of all parturient women. In the puerperium there are two types of gonococcal infection. The first variety, which is the more common, begins with a rise of temperature on the first day or even during labour, and this continues for six or seven days. The lochia becomes foul and musty in odour. The pulse-rate is not so high as in streptococcal infection. In about 12 per cent. of the cases further trouble in the form of pelvic abscess develops. The second variety of gonococcal infection begins to give rise to symptoms about the end of the first week, when the temperature, previously normal, suddenly rises to 102° or 103° and there is severe pain and tenderness over the lower abdomen. In most cases this indicates implication of the appendages and often pyosalpinx.

In treating both types of these gonococcal cases conservatism gives the best results. Catharsis, elevation of the head of the bed, and the application of an ice-bag to the lower abdomen is all that is required. Intra-uterine and even vaginal douches do harm. These cases are seldom fatal, but permanent effects on the pelvic organs often result.

In colon infection the symptoms usually begin about the fifth day with sharp elevation of temperature and often chills. The lochia becomes exceedingly foul. It is in these cases that the gentle intra-uterine douche is clearly indicated.

In streptococcal infection, on the other hand, Harrar has had no success with the intra-uterine douche, and he follows the same line of treatment as in gonococcal cases. In sapremias with retention of secundines, he advocates gentle manual removal and intra-uterine douches. He never uses the curette in the puerperium under any circumstances.

To sum up, the treatment adopted in cases of puerperal infection is as follows:—If the temperature and pulse remain elevated, take a smear from cervix and have it reported on. Meantime give a purge, elevate the head of the bed, and apply an ice-bag to the abdomen. If the gonococcus or streptococcus is reported as present, continue the foregoing treatment. In their absence explore gently for retained

membranes, and if present remove them and douche. If the colon bacillus is present, douche and continue above treatment. If exudates form, watch for pus formation and evacuate it immediately.

PITUITARY EXTRACT IN DELAYED LABOUR AND INDUCTION OF LABOUR.

Up to now we have had no very satisfactory drug which will act on the parturient uterus without affecting the child. Quinine is effective in certain cases in stimulating uterine pains, and does not cause the tonic contraction which renders ergot inadmissible in such circumstances, but it often fails. In extract of pituitary we may have the substance we have been looking for. In a former number of the *Journal* (January 1911) we gave abstracts of papers dealing with its action on the uterine muscle in cases of post-partum hæmorrhage in which it was most effective.

From the Breslau Klinik come two papers, one by Bondy and the other by Stern (*Berl. klin. Wochenschr.*, No. 32, 1911), dealing with its action during pregnancy, and its effect in inducing labour pains in cases where premature labour has to be induced.

Bondy records ten cases in which he used it for delayed labour. In two of these it did not do much good, but in the other eight it was most effective. The patients had been in labour for from twenty-three to forty-eight hours—on an average thirty-six hours. One c.cm. of pituitary extract was given hypodermically. Almost immediately the pains increased in frequency and severity, and in from ten to thirty minutes, on an average twenty-eight minutes, the child was born. The placenta quickly followed, and there was no post-partum hæmorrhage. There was no ill effect on the child.

Induction of Labour.—Stern records three cases in which he gave pituitary extract for the induction of labour. Two of them were for tuberculosis of the lungs and larynx, and the third for nephritis. In two the results were good, the child being born spontaneously, but in the third labour only came on after the use of cervical dilators.

In the first case 0.6 c.cm. pituitary extract was given hypodermically, and in twenty minutes labour pains began, lasted for about an hour, and then became very feeble and intermittent. Next morning the os was dilated, so that it admitted two fingers. Another similar injection was given with the same result. On the third morning a third dose was injected, and regular labour pains set in, and the child was born seven hours later. In the second case more injections had to be given, nine in all spread over four days, but at the end of that time spontaneous birth occurred. As has been said, in the third case other means had to be adopted. These observations of Stern's are interesting, and doubtless within the next few months we will have other

observers giving their experience. The drug can evidently be given in repeated doses with perfect safety. Stern points out that the preparation must be fresh, and there must be no trace of other substances such as alcohol in the syringe, otherwise the drug will not act.

COMPLETE PROCIDENTIA IN NULLIPAROUS WOMAN.

Kepler records a case (*Amer. Journ. of Obstet.*, June 1911) of complete prolapse in a nulliparous unmarried woman of 22. In connection with this case he has collected the statistics of similar recorded and unrecorded cases, and comes to the following conclusions:—It is of more frequent occurrence than is generally supposed, the author having collected eighty cases in addition to the seventy recorded. It may or may not be associated with congenital defects of the reproductive organs, but is nearly always associated with other physical degenerations. In a large proportion of the cases there is mental perversion, varying from mild hysteria to complete idiocy. This latter point is one the author lays stress on, and in his own case he sterilised the patient at the time of operation because she was mentally defective. The prolapse is treated in these nulliparous women by the ordinary operative procedures.

INFECTIOUS DISEASES.

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EPIDEMIC POLIOMYELITIS.

- FLEXNER (*American Journal of Diseases of Children*, August 1911) discusses the control and treatment of this interesting condition. Since 1907 poliomyelitis has extended from the Atlantic seaboard over the entire United States. It appears difficult to estimate the number of individuals attacked, as doubtless mild and abortive cases of the disease have been overlooked. The mortality of the recognised cases has been the average noted in Europe—about 10 per cent. Flexner advises measures of prevention based upon knowledge of the mode of infection that clinical observation and experimental investigation have so far supplied. It is established that the virus can be transferred by human agency, which includes not only the actively infected or ill but also healthy “carriers,” as is the case in epidemic cerebro-spinal meningitis. Adequate measures of isolation and quarantine are accordingly recommended. So far as can be judged by laboratory inoculations a period of isolation of

from three to four weeks may be regarded as sufficient, unless the attack of illness has been unduly prolonged.

It has been found that in the monkey the virus of poliomyelitis passes from the central nervous system into the nasal mucosa, and that monkeys can be most readily infected by inoculation of the nasal mucosa. Special attention therefore should be accorded to the nasal and buccal secretions of persons affected with the disease, and doubtless also those in contact with them. The common house fly should also be regarded with suspicion. Laboratory-bred flies have been proved capable of harbouring the virus on their bodies in a living and infective state for at least forty-eight hours.

Flexner also discusses the cure of the disease itself. He does not hold out much hope of successful results with serum treatment, as the blood of inoculated animals appears to be relatively weak in the immunity principles. What is required, therefore, is an antiseptic drug which will act on those parts of the nervous system which are specially affected. The virus of poliomyelitis is probably first planted on the leptomeninges, in which it develops, causing a cellular exudation, which by blocking the blood-vessels leads to the secondary production of the lesions in the nervous tissue itself. The most likely remedy is, in Flexner's view, urotropin, which is an internal antiseptic of some power and is eliminated in some degree from the general circulation into the subdural space. Experiments on monkeys suggest that it is capable of, in some cases, preventing paralysis, and in others of materially lengthening the incubation period. Flexner takes a relatively hopeful view of the treatment of the disease in human beings, holding that much of the supposed damage inflicted on the nervous system at the onset of the paralysis is remediable.

HÆMORRHAGIC CHICKEN-POX.

Knowles (*New York Medical Journal*, 6th May 1911) reports an interesting case of this uncommon condition. The patient, a male of 2 years, had no hæmophilic tendency. The vesicles apparently came out in a normal manner and contained clear fluid, but the contents rapidly became cloudy and, within twelve hours, hæmorrhagic. The mucous membranes were involved, lesions being noted on the tongue, soft palate, and tonsils. The vesicles in drying up showed necrosis, which was best marked on the buttocks, gangrenous areas being observed especially in that situation. The patient also suffered from croup and bronchitis, and death occurred exactly one week after the onset of the eruption.

Knowles, after a careful analysis of the literature of severe chicken-pox, concludes that there is a hæmorrhagic form of the disease which tends to end in gangrene of the lesions. This is to be distinguished

from the type usually spoken of in this country as varicella gangrænosa. This latter form of the disease probably depends upon secondary infection of the lesions with various micro-organisms, and in most instances is not associated with hæmorrhage into or between the vesicles. The literature shows that while hæmorrhage is usually noticed in the vesicles themselves, purpuric or petechial spots are occasionally observed between the elements of an apparently normal eruption. Of the cases collected by the writer several vomited blood and passed blood in the stools or urine. A curious feature of some of them was that petechial hæmorrhages or bleeding from the mucous membranes occurred before the appearance of the chicken-pox eruption. Most of the cases appear to have terminated fatally, as was only to be expected if the hæmorrhagic tendency is in chicken-pox, as in other acute infectious diseases, evidence of a toxic attack. Knowles considers that gangrene which merely follows an ordinary attack of chicken-pox should not be classed as varicella gangrænosa but termed "dermatitis gangrænosa infantum." His paper is an interesting contribution to the literature of malignant types of chicken-pox.

ARTHRITIS IN EPIDEMIC CEREBRO-SPINAL MENINGITIS.

Vigot (*Gazette des Hôpitaux*, 20th December 1910) reports the case of a patient, a male of 18 years, treated with Dopter's serum. After four intra-spinal injections of 20 c.c. on successive days the acute symptoms subsided, but on the seventh day of illness arthritis, with considerable effusion, declared itself in both knees. There was well-marked swelling but little redness, and the temperature rose to 104° F. Two days later 80 c.c. of fluid were withdrawn from the right knee-joint and 60 c.c. from the left. The fluid in both cases was purulent and gelatinous and contained meningococci. The treatment adopted was interesting, 20 c.c. of Dopter's antimeningococcal serum being injected into each joint. The right knee responded at once, but in two days the left knee was again much swollen and was punctured a second time. The fluid was still purulent and a few meningococci were present. A further injection of 10 c.c. of serum was sufficient, and within a week both joints were quite normal.

Vigot discusses this complication of meningitis, and points out that while in most instances the arthritis appears in the first week of illness, it may even precede the first meningeal symptoms. It must, of course, be distinguished from the simple arthritis due to injections of serum and also from rheumatic and gonorrhœal inflammations.

BRILL'S DISEASE.

Louria (*Medical Record*, 26th August 1911) gives an account of some cases observed in the Jewish Hospital of New York which presented

the characteristics of this condition. It may be remembered that Brill in 1910 published a paper describing a hitherto unknown infectious disease, of which during twelve years he had seen 221 examples. A Committee of the New York Academy of Medicine investigated the evidence brought forward and decided that the disease as described by Brill presented a fairly uniform symptomatic picture and seemed entitled to recognition as a clinical entity. The clinical picture was quite distinct from that of typhoid fever, and it seemed conclusive that the cases were not instances of either typhoid or paratyphoid infection. On the other hand, the Committee declined to decide whether they represented an atypical form of some already recognised disease or whether they were instances of a disease hitherto unrecognised.

The symptoms as described by Brill, and now by Louria, are as follows:—The onset of illness is sudden, with chills, fever, and severe headache. In most cases prostration and incapacity for work are marked. Constipation is a prominent feature. Epistaxis is occasionally observed. Cough is present in many of the cases. The tongue is often moist and, except for the edges, is coated with white fur. The pulse is rapid and does not present the characteristic disproportion of typhoid fever. Congestion of the conjunctiva is a prominent feature. The headache appears to last throughout the illness, only disappearing as the temperature falls. Kernig's sign is present in most of the cases, and rigidity of the neck is almost invariably observed. The eruption is, however, the most prominent symptom. It usually appears on the third or fourth day after the onset, and does not disappear until the fall of the temperature. The spots are described as maculo-papular and somewhat resembling measles. They appear as one crop all over the trunk and extremities and rarely invade the face. As a rule they do not disappear on pressure, and in severe cases have a distinctly petechial character. In only 3 out of 18 cases did Louria find a positive diazo reaction. In no case was there leucopenia, the count as a rule being between 10,000 and 12,000 whites. Blood cultures were sterile and Widal's reaction always negative. The temperature curve is characteristic. Within 24 or 48 hours it rises to 104° F., and maintaining this level continues for 10, 12, or 14 days, when it falls by a rapid lysis, within 2 days, to normal. The spleen is moderately enlarged.

When Brill's first account of this disease was published it struck many of us that mild typhus fever would account for the symptoms observed. Goodall in particular identified himself with this view, against which little of weight has been alleged. The duration of the disease, the eruption, the onset, the rapid termination, all point in this direction. The comparatively large number of patients from Eastern Europe was another suspicious circumstance, and at first sight

the fact that in this new series of cases 14 out of 18 were Russians, and 3 of the remainder also from Eastern Europe, seems almost final. But here we are in risk of error, for Louria points out that at the Jewish Hospital a large proportion of the patients come from that part of the world. Nevertheless it is difficult to see how we can exclude typhus. The strong argument against it is the benignant character of the infection; of the 239 cases under review not one died. Again, the eruption in most cases was profuse and well marked. Our experience of mild typhus in Edinburgh is that the eruption is usually scanty, and we are accustomed to regard the profuseness of the rash as directly proportionate to the severity of the case. Another point of interest is Louria's definite statement regarding the absence of the diazo reaction, a sign which in our experience is practically never missing in the acute stage of typhus fever. It is, again, remarkable that the description of the American authors leaves the impression that the disease is not actively infectious, although it is well known that sporadic cases of typhus do occasionally occur. We can only conclude that if the condition is, as seems most probable, typhus fever, it is typhus fever in a very highly modified form.

THE VACCINE TREATMENT OF TYPHOID FEVER.

In 1909 Watters and Eaton reported the successful treatment of 34 cases of typhoid fever with vaccines. They now (*Medical Record*, 6th May 1911) publish reports of 35 additional cases. The results of the first series were very encouraging and compared extremely favourably with those obtained in 71 patients treated on ordinary lines. The average duration of the fever, for instance, in those treated with vaccines was only 15·5 as against 25·3 days for the untreated, and the stay in hospital was proportionately shortened. Relapses were reduced in frequency. In the present paper the temperature charts of a large number of the patients are given, and it is thus possible to estimate the value of the treatment. The doses employed varied from 3 to 50 million micro-organisms, and the tendency was to reduce rather than increase the dose. Several patients appear to have received one dose only, either on admission to hospital or shortly after. Others again were inoculated at short intervals, in one case daily for almost a week, and in these comparatively small doses of 3 or 5 million were used. The main feature of the dosage was that the worse the patient the smaller was the quantity of vaccine given, and in apparently hopeless cases small doses were given daily with excellent results. There were no deaths in the series, and no ill effects followed the injection of the vaccines.

The treatment of typhoid fever by vaccines is still upon trial. So far as can be gathered from the literature, the mortality of the disease

is lowered by their employment and there are fewer relapses. As regards the duration of the fever, the charts given by Watters and Eaton are not quite convincing. Even when the patient has come under treatment by the end of the first week, the fever is in most instances prolonged until the end of the third, and a very large number of untreated cases of the disease have no longer a duration. On the other hand, a most interesting chart shows an abrupt termination by crisis the day after the first dose of vaccine, and another demonstrates the case of a patient who received five doses, each of which was followed by a well-marked improvement in the temperature level. It is probable that vaccines have a future before them in those cases of typhoid fever which come under observation early. Unfortunately, however, the average patient is more than a week ill before the nature of his illness is recognised.

DISEASES OF THE EAR, NOSE, AND THROAT.

By A. LOGAN TURNER, M.D.,

and

W. G. PORTER, M.B., B.Sc.

THE EFFECT OF BIER'S CONGESTION IN NON-SUPPURATIVE DISEASES OF THE EAR.

CONRAD STEIN, an assistant of Professor G. Alexander, has tried the effect of Bier's congestion in the non-suppurative affections of the middle ear (*Arch. f. Ohrenheilk.* 1911, Bd. lxxxvi. p. 92). A really successful result of this treatment was obtained in only a few cases. In two cases of acute Eustachian obstruction the congestion appeared to greatly increase the effect of inflation which had previously done no good. Similarly in a case of chronic middle ear catarrh, after a fortnight's treatment the serous fluid in the middle ear disappeared, and along with it all the symptoms, although previous to this all the usual methods of treatment had been employed in vain. In a number of patients, while no actual therapeutic success could be recorded, the congestion itself was found to be pleasant and accompanied by a sense of subjective improvement. Especially remarkable was the effect on the tinnitus, which was in many cases greatly diminished, and that not only when the blood-pressure was diminished, but also when it was normal or even when markedly increased—in fact the greatest improvement occurred in patients who had a high blood-pressure. In no case, however, did the tinnitus entirely disappear. But the author found that in those cases where the source of vascular tinnitus was in the ear itself (*i.e.* in acute inflammation of the ear and in otosclerosis) the tinnitus was frequently increased. He accordingly thinks we should

differentiate between vascular tinnitus depending on local and general disturbances of circulation. He concludes—(1) That Bier's congestion is not a method of treatment which should be used by itself in cases of non-suppurative ear disease, but may in certain cases intensify the effect of other methods of treatment. (2) It is possible to distinguish in some degree the genesis of subjective tinnitus by the application of Bier's congestion. In cases in which the tinnitus diminishes we may assume that the pulsations of the cerebro-spinal fluid are perceptible to the patient. Such subjective sounds are produced especially where the blood-pressure is high, whether from physiological or pathological causes.

ON THE SUBMUCOUS TREATMENT OF HYPERTROPHY OF THE TURBINATED BODIES.

Rabotnow (*Zeitschr. f. Laryng., Rhinol.*, Bd. iv. p. 137) discusses the treatment of hypertrophy of the turbinated bodies. The older methods of treatment by the cautery or by reduction by scissors and snare have their disadvantages, and are not universally applicable. The submucous application of the cautery has previously been proposed, and Kyle and Linhart have advocated submucous operations. Linhart uses three instruments (*Laryngoscope*, 1908, p. 128). He first makes an incision from above downwards in front of the hypertrophied portion of the turbinated body; the soft parts are then separated from the bone by a raspatory. A wedge-shaped knife is then inserted to partially destroy the periosteum and the cavernous plexus. A tampon is finally inserted between the septum and turbinated body. Rabotnow has used this method of treatment in thirty cases. The effect is rapidly induced; in fact as soon as the plug is removed, *i.e.* after forty-eight hours, nasal respiration is established. Within two weeks all signs of the operation disappear. The operation has the following advantages:—It does not interfere with the functions of the nose, as no superficial cicatrix forms and the mucous membrane is not destroyed. It is aseptic, possible healing takes place in two days, and, most important of all, the effect of the operation is permanent. In certain cases submucous resection of the inferior turbinated bone may be undertaken (Stuart Low, Würdemann, Zarniko). This procedure is indicated where there is abnormal curvature or undue size of the turbinated bone, and also when the nasal cavities are very narrow.

THE SURGICAL TREATMENT OF LARYNGEAL TUBERCULOSIS.

Stimulated by the success of his operations upon the larynx in malignant disease of that organ, Gluck, in association with Soerensen, has turned his attention to the treatment of laryngeal tuberculosis by

external surgical methods. In a recent paper (*Zeitschr. f. Laryngologie*, Bd. iv. 1911) they discuss the question and give their results. They are careful to make it understood that the case suitable for operation should be carefully chosen, and, in the second place, that the method to be employed must be adapted to the requirements of each case. The affected larynx cannot be regarded in the same light as a tuberculous testicle, kidney, or joint. It is of primary importance to note in the first instance the condition of the lung. Primary tubercle of the larynx is extremely rare, and may practically be regarded as not entering into the question. The condition of the lung may be such that there is no longer any prospect of improvement or cure, or from the nature of the tuberculous process in the lung, an aggravation of it is to be feared if the larynx is operated upon. In the first category are cases of cavity formation in considerable areas of the lung, along with quantities of purulent expectoration. In the second class are all acute and progressive forms of pulmonary tuberculosis, cases of hæmoptysis, and pneumonic and pleuritic conditions. A further contra-indication to the laryngeal operation exists where there is tubercle in the nose, pharynx, and mouth or trachea. He regards it of the greatest importance to know the condition of the tracheal mucous membrane before determining upon operation, though it is not always possible to determine this accurately.

From what has been said it is obvious that in by far the larger number of the cases of laryngeal tuberculosis an operation likely to terminate in a cure need not be considered.

The cases, however, which may be regarded as suitable for interference by an external operation are those in which the general condition of the patient is still relatively good and where the pulmonary disease is still confined to limited areas and shows no acute progressive tendency; where the trachea and pharynx are healthy; where the laryngeal disease, in spite of appropriate treatment and local endo-laryngeal applications, is still progressive.

The operations which may be considered are—(1) Tracheotomy. (2) Thyrotomy in conjunction with some plastic operation. (3) Resection or extirpation of the larynx.

Tracheotomy is indicated when there is marked stenosis of the larynx, which is not amenable to endo-laryngeal methods; the favourable influence of this both upon the general well-being of the patient and upon the state of the lungs is often striking. The anxiety and feeling of oppression disappear, the cough becomes ameliorated, the bronchial secretion can be more easily expelled, and with the better ventilation of the lungs there is a general improvement. With the complete rest thus given to the larynx the inflammation and swelling tend to subside. Swallowing becomes easier and the tuberculous disease cicatrises. While this is observed in some cases, in others,

again, the tuberculous process, in spite of tracheotomy, nevertheless progresses. To the former class belong those cases in which the general condition is good and where the disease in the larynx is limited to the more superficial tissues. To the second class belong those cases where the ulcers are deep and extensive and where there is purulent perichondritis and necrosis of cartilage. Here the tracheotomy can only mean relief from threatening asphyxia. In tracheotomy, therefore, we may have an excellent curative agent in those cases in which the laryngeal affection is not too far advanced.

The so-called upper tracheotomy is exclusively carried out, because it can be quickly and easily done under local anæsthesia, and no wound complications follow. The cannula should fill the lumen of the trachea without causing pressure, and the cannula is left *in situ*, if possible, without being changed until the external wound is healed. A small opening is left in the upper and lower end of the superficial wound, into which iodoform gauze is placed for drainage purposes.

Thyrotomy has not proved a very satisfactory operation in some hands as a method of dealing with localised tubercle in the larynx. Although some cases have been satisfactory, in the majority expectations have not been realised. In spite of removal of the diseased tissue the wound has again become infected, and the condition of the larynx has even become worse than before. The explanation of this appears to be due, on the one hand, to an unfortunate selection of the cases, and, on the other, to the fact that the operation of thyrotomy is hardly the correct method with which to deal with this condition. In Gluck's experience the cases suitable for laryngofissure are essentially those which run a more chronic course. The method adopted is to excise the diseased tissues right down to the cartilage, and then to cover over the gap thus made with skin grafts. These are stitched into the larynx, which is then packed, partly to ensure the fixation of the grafts and partly to prevent the introduction of any of the sputum. The tampon is removed after two days. As a result of this procedure the interior of the larynx is clothed with healthy skin, which is capable of resisting fresh tuberculous infection. At a later date the two halves of the thyroid cartilage are brought together. The voice, naturally, is rough and toneless, but is sufficient to permit of the individual carrying on a conversation.

The third method of dealing with the disease is by resection and extirpation of the larynx. In spite of opinions contrary to this procedure, the writers have performed partial or total extirpation of the tuberculous larynx with considerable success. They tabulate the indications for total removal of the larynx as follows:—In extensive and deep-spreading ulcers of the mucous membrane; where there is abscess formation, necrosis of cartilage, and perforation into the soft tissues outside the larynx; in cases of extensive tuberculous tumour

formation in the larynx; and, lastly, where there is ulceration and infiltration of the upper aperture of the larynx with great dysphagia, causing defective nourishment of the patient. If there is extensive breaking down in the lungs and an acute progressive condition the operation must not be considered.

Altogether, thirty-four operations have been performed on account of tuberculous disease—tracheotomy in seven, thyrotomy in five, hemi-resection in two, and complete removal of the larynx in twenty cases. Of the five cases subjected to thyrotomy, one had reinfection of his wound and died some months later; the remaining four healed. Three of these are still alive fourteen, eleven, and eight years after the operation. The two cases of hemi-resection are both alive, seventeen and nine years after treatment. Of the twenty patients submitting to complete removal of the larynx, one died as the result of the operation. With regard to the remaining nineteen, seven healed completely, four being alive and well twelve, four and a half, four, and three years after the operation. The other three again developed tuberculosis and died, one from pulmonary and two from intestinal tubercle. In the remaining twelve the removal of the larynx only led to a transient improvement. They died in the course of a year after the operation. The writers are of the opinion that greater success will be met with in the future, when the precise indications are better understood and the cases are selected with greater certainty.

NEW BOOKS AND NEW EDITIONS.

Essays and Clinical Studies. By F. G. CROOKSHANK, M.D. Pp. 245.
London: H. K. Lewis. 1911. Price 7s. 6d.

THIS book is a collection of addresses given before scientific societies, and of articles contributed to medical journals, during the last twelve or thirteen years. Their publication in one volume is very satisfactory, for though there is considerable diversity in the subjects treated, the author shows throughout consistent qualities of thought and style. In every case Dr. Crookshank handles his subject from the sure ground of personal experience, and how wide that experience has been will be seen from a short autobiographical note which appears in one of the addresses. Here he describes himself as "one of the disappearing band of halftimers, a general practitioner, who is at once medical officer of health, hospital superintendent, police surgeon, education-officer, and supervisor of midwives." The book contains papers based on almost every one of these activities, and it is remarkable that one so busily engrossed in this multifarious practice should have found time to preserve and to communicate the results of his experience.

Peradventure, should there be only ten or five such, we would plead earnestly for the conservation of halftimers.

The first paper is a short account of the life, opinions, and practice of the celebrated Italian physician, Bernardo Ramazzini. In it ancient and modern notions of pathology and therapeutics are drawn together in an instructive way, and the essay demonstrates the interest and value of the historical method in medical writing. Thereafter the author gives us a succession of studies on insanity, phthisis in asylums, scarlet fever, diphtheria, and other subjects. The most valuable papers in the book are those on scarlet fever and diphtheria. They show in a high degree careful and keen clinical observation, and an extensive and intelligent appreciation of the great bacteriological literature on those subjects. With this double equipment, the author adjusts in a most illuminating way clinical and laboratory studies. Thus he takes the bacteriological law of passage and intensification of virulence, and in a very acute argument applies it to the clinical facts of epidemics of scarlet fever, showing from his own experience as superintendent of an infectious diseases hospital how the early cases in an epidemic are most highly infectious, and the later ones less so. In this way he makes a valuable classification of cases of scarlet fever into intensive and regressive cases. This is given as a specially brilliant example of the author's power of associating scientific and clinical data, but the same quality, which is rather uncommon in medical writing, is shown throughout the book. The treatment of scarlet fever and of diphtheria receives also a very careful and practical discussion.

The book can therefore be highly commended. There is no attempt to give a full account of the subjects treated. The essay form in which the subjects are presented makes this impossible. But in each an unusually wide view of the subject is maintained, and while the clinical aspect is put in the forefront, this is always corrected and adjusted to modern scientific fact and theories. The style, too, is light, clear, and pleasant, and the writer has the gift of conveying wise matter in a witty form. In some of the earlier essays, in that entitled "The Public Health, the Professor and the Public" and in "Some Criticisms," the author shows a tendency to lecture and scold severely both the practitioner and what he calls "the laboratory precisian," but this hypercritical manner is happily absent from the later papers.

Dr. Crookshank may be congratulated on presenting to the profession these illuminating and stimulating essays.

The King's Evil. By RAYMOND CRAWFURD, M.A., M.D., F.R.C.P.
(Lond.), Fellow of King's College, London. Pp. 187. Oxford :
At the Clarendon Press. Price 8s. 6d. net.

THIS volume gives in ampler form the substance of the Fitzpatrick Lectures delivered before the Royal College of Physicians last spring. The author states that it has been his endeavour to make the subject a living part of the general history of England, and in so doing he has thought it desirable to quote many authorities *verbatim*. This undoubtedly adds to the value of the work for the student of medical history, but it makes it heavy reading for the general reader. The work is enriched with an extensive bibliography, but it has no index. It has several illustrations, not only of touch pieces but also pictures photographed from various sources showing the Ceremony of Healing as practised by Edward the Confessor, Henry II., Queen Mary, Henry IV., and Charles II. Copies of the Office of Healing of several English Sovereigns are given in full, and in an Appendix there are several proclamations relating to the King's evil taken from the Public Record Office and the libraries of the British Museum, the Society of Antiquaries, and the Earl of Crawford.

The origin of the royal touch is fully dealt with. The question as to whether the Kings of England or the Kings of France were the first to make use of the royal touch for the cure of disease is one which has often formed the subject of controversy. Dr. Crawford considers that customs such as this must not be considered as the product of a day. In all nations the art of healing has been accorded a divine parentage, and in very early times it became the attribute of sovereignty. Pyrrhus, King of Epirus, in the third century B.C., cured diseases of the spleen by the touch of the great toe of his right foot, Vespasian restored sight to a blind man by touching his eyes with spittle, and Adrian cured dropsy by the touch of his finger-tips. With the advent of Christianity the Great Physician Himself wrought many miracles of healing by His mere touch, and to His disciples He bequeathed "power against unclean spirits to cast them out, and to heal all manner of sickness." Brief reference is made to the cures wrought by the early fathers of the Christian Church, but no reference is made to the many miraculous cures, such as those recorded in the fourth century by Athanasius, Ambrose, Chrysostom, and Augustine; in the fifth century by Hilary and Jerome; and in the sixth by Augustine of Canterbury and Cyril. The first reliable record in French or English history of healing by royal hands is ascribed to Robert the Pious (996-1031), and shortly after this the first recorded case in English history is the cure of a scrofulous woman by Edward the Confessor. There is no record of the immediate successors of the Confessor exercising the miraculous gift of healing.

William the Conqueror was probably too much occupied, as one historian remarks, with killing those who were well, and the uproarious son of the Conqueror affected no share in the sacred mesmerism of their predecessor. There is satisfactory evidence that it was practised by Henry II. and a century later, in the time of Edward I., the healing power of the King was fully recognised. It was continued during the succeeding centuries down to the reign of Queen Anne, and in the volume before us there are many interesting details of the popularity and alleged efficacy of treatment by touch and full descriptions of the ceremony as practised by different monarchs. A register was kept by some of the Kings of those who received the royal touch, and the register of Charles II. shows that the number during this reign amounted to 90,798.

Although this superstition has now entirely died out as regards the touch of the Sovereign, it still prevails as a belief in many parts of Britain that the touch of the seventh son of a seventh son, without any daughter intervening, has the special power of healing scrofula. This subject is only incidentally mentioned by our author, and is worthy of more extended inquiry. The late Sir Arthur Mitchell, in a paper read before the Scottish Society of Antiquaries in 1860, stated that he had seen more than one poor idiot with strumous complications for whom this magic touch had been obtained. A Lewis gentleman informed him that it was customary for the seventh son to give the patient a sixpenny-piece with a hole in it through which a string is passed, and the patient had to wear this constantly round his neck. In the event of its being lost or removed the malady, it was believed, would break out again.

La Maladie de Little; Etude anatomique et pathologique. By MME. LONG-LANDRY. Pp. 150. Paris: H. Delarue. 1911.

CASES of congenital spastic paralysis or "Little's Disease" are often met with, and they are easy of recognition; but, as the condition is not a fatal one, descriptions of its pathological anatomy are relatively few, and there is still much to be learned about its causation. Mme. Long-Landry records the pathological examination of four cases of Little's disease which she herself carried out in Prof. Déjerine's Laboratory at the Salpêtrière, and she summarises the main facts of between 70 and 80 previously published records.

Her main conclusions are as follows:—

(1) Little's disease may, as the post-mortem records show, be due to a variety of lesions differing in nature and situation.

(2) There are cerebral and cerebro-spinal forms of the disease, and also a purely spinal variety which has been described by M. Déjerine.

(3) The etiological factors are of two kinds: (*a*) infectious causes acting during intra-uterine life: and (*b*) birth injuries.

(4) The interference with movement is not entirely accounted for by the contracture. For when the contracture is very slight we find choreo-athetotic movements which show that there is also a defect of voluntary motility.

(5) The tendency of the rigidity to assume a paraplegic form, and the presence of abnormalities of voluntary movement are characteristic of an early implication of the nervous centres. They are due to the efforts of the nervous system, which has become damaged during its development, to adapt itself to its altered conditions.

(6) This physiological explanation is equally applicable to all forms of congenital diplegia, whether due to intra-uterine causes or to those acting at the time of birth; and it allows of their all being grouped together under the head of "Little's Disease."

There are 52 illustrations and a very full bibliography.

Consultations Médicales: Maladies de l'Appareil Digestif et de l'Appareil Respiratoire. Par H. HUCHARD. Paris: Baillière et Fils. 1911. Price 12fr.

THIS volume is the third of a series by the distinguished physician of the Necker Hospital, and any one who has an average knowledge of French will greatly enjoy those lectures. Here is a racy style along with dogmatic opinions founded on observation and experience of singular value. Every subject treated is looked at from fresh points of view, and usually a résumé of the historical aspects is given, so as to elucidate the modern conception. At the beginning of each lecture half a page or so is devoted to a synopsis of what is to come; this alone involves methodical arrangement, and enables the hurried reader to pick out what he wants. Many of the lectures deal with the less common described forms of disease, such as influenzal pneumonias, cerebral pneumonia of infants, diaphragmatic pleurisy, hysterical inertia of diaphragm, lung and heart of the hump-backed—in fact, all through the arresting freshness of selection and treatment is most attractive. In the discussion on prophylaxis of tuberculosis it is gratifying to find the statement that by virtue of sanitary and hygienic enactments England gains 50,000 human lives a year. In the same connection he gives a truly ghastly account of the prevalence of alcoholism in France; he regards it is the great "purveyor" of tuberculosis, and the solution of the prevention of this disease is bound up with the anti-alcohol struggle. Discussing dyspepsia, he deprecates too much trust in laboratory results, dilatation without dyspepsia being of no account.

Much space is devoted to biliary lithiasis, and here, as all through, brief sketches of actual cases aptly illustrate the theme.

Diseases of the Skin. By JAMES H. SEQUEIRA, M.D.(Lond.), F.R.C.P., F.R.C.S., Physician to the Skin Department and Lecturer on Dermatology at the London Hospital. With 44 Plates in Colour and 179 other Illustrations. London: J. & A. Churchill. 1911. Price 25s. net.

IN recent years there have been many advances and great changes in the manner of dealing with numerous familiar affections of the skin, and Dr. Sequeira's name has been honourably associated with the introduction and elaboration of some of the best known of those methods. It is fitting, therefore, that he should be the exponent of the modes of working adopted. In the treatise before us, however, he has not confined himself to such a restricted area, but has embraced an account of skin diseases in general. For this task he is well qualified, for he is endowed with the faculty of describing succinctly what he sees, and of conveying to the mind an accurate picture of morbid phenomena. Hitherto no classification of cutaneous disorders has proved quite satisfactory, and he has therefore fallen back on an arrangement on etiological lines, so far as this has proved possible. Where such a plan is impracticable the diseases are grouped according to their morphological characters. Such a device seems to meet the difficulty as well as is achievable in present circumstances. In reading through the volume we have been much impressed with the admirable way in which the salient features of the various morbid conditions are sketched, their outlines being drawn without a superfluous word. To extract the full value of such descriptions every sentence ought to be scrutinised and its significance thought over, and we can conceive no better training for the student's mind, intent on assimilating knowledge, than a careful perusal of this work. In so doing he cannot fail to acquire facility in the art of expressing himself clearly and tersely, an accomplishment he will find of infinite service in his written examinations, and of much use in facilitating note-taking subsequently, when in practice.

While, therefore, we have nothing but praise for those paragraphs devoted to definition, etiology, pathology, clinical features and diagnosis, in too many instances the directions for treatment are far too scanty in a work primarily designed for the student. With some, indeed, of these we cannot agree. Surely in the management of pityriasis capitis little advantage can be gained by shampooing at such rare intervals as every two or three weeks! (p. 183). Again, the mode of preparing a boric starch poultice given at page 524 is

incorrect, the method of applying one as stated on page 95 is erroneous if not actually impossible.

But a more serious indictment is one relating to mistakes in nomenclature and imperfect press correction. The word comedone as nominative singular is persistently employed. No such exists. It is comedo. Again, the mongrel appellation dermatitis artefacta is used to designate what were formerly termed feigned eruptions. There is no need to manufacture a name; Pindar supplies us with the exact expression. He speaks of ἑλκεα αὐτόφυντα, self-inflicted ulcers or wounds. Dermatitis autophyta is therefore the phrase. Press correction has been done in a very slovenly fashion. The loose slip of errata covers only a few of the many misprints. The book is profusely illustrated, and many of the pictures, both in colour and in black and white, are admirable, but there are also failures in both categories. The wisdom of presenting in the pages of a student's manual illustrations which may be misleading is at least questionable. These deficiencies which we have thought it necessary to comment upon can be corrected in a second edition, which, we are sure, the intrinsic merits of this treatise will ere long render necessary.

The Medical Diseases of Children. By REGINALD MILLER, M.D. (Lond.), M.R.C.P., Physician to Out-Patients, Paddington Green Children's Hospital, etc. Pp. 541. Bristol: John Wright & Sons, Ltd. 1911. Price 12s. 6d. net.

MANY attempts have been made in times past to present the subject of the medical diseases of children, at once systematically and satisfactorily, within the limits of a small book. None of these can be said to have been altogether successful. Those authors who have aimed steadfastly at completeness with shortness have been dry and uninspiring; while those who have attained any great measure of success have done so because, and in proportion as, they departed from the plan of being always systematic, and let themselves go disproportionately on these subjects which they really had at heart. Dr. Miller has taken this latter way, and, as his interests are wide and his clinical and teaching experience considerable, he has produced an excellent and most readable work.

Of the eleven sections into which the book is divided, the two first deal with the examination, development, and feeding of children; the next two with constitutional and infective diseases, and the remaining seven with the disorders of the various systems of the body. There are two appendices occupied, one with dietetic and therapeutic measures, and the other with certain institutions and other agencies by which invalid London children may be benefited.

The most novel and noteworthy feature about the arrangement of

the book is the large section on infective diseases. This occupies more than one-third of the whole volume, and includes, not only the ordinary ailments of childhood, but also a large number of diseases due to known or unknown organisms. Its first divisions deal with the various lesions produced by the pneumococcus and tubercle bacillus in the thorax, abdomen, joints, meninges, and elsewhere. In the treatment of pneumococcic empyema Dr. Miller favours resection of a rib as a routine measure; and recommends simple incision only in those children who are too weak to stand the graver operation. He does not mention the fact that recovery after a single aspiration is not a very rare occurrence in children of good constitution. On the question of operation in abdominal tuberculosis, the author gives a somewhat uncertain sound. He is evidently not yet converted to the view that surgical interference is always a vain proceeding.

In the section on the manifestations of the rheumatic infection, including chorea, Dr. Miller, as becomes a St. Mary's Hospital man, writes very fully and well. In their treatment, he follows Dr. D. B. Lees in his fearless use of the salicylate combined with bicarbonate of soda. Rheumatic arthritis he regards as almost certainly an organismal disease, and he recommends von Bier's hyperæmic method in its treatment. Erythema nodosum is classed as probably not rheumatic. The author has not found it to be benefited by salicylate of soda or by any other drug.

The chapter on hereditary syphilis is good, but rather short relatively to the importance of the subject. Other of the infective diseases dealt with are those caused by the meningococcus, typhoid bacillus, gonococcus, and influenza bacillus. The subjects of polio-encephalitis and poliomyelitis are also fully discussed from a modern point of view.

Probably the most valuable article in the section on the digestive system is that on pyloric stenosis, which gives evidence of careful clinical study of the disease as well as of a considerable knowledge of its extensive literature. The author should not, however, have founded arguments on the old idea that the hypertrophy present affects the circular muscular fibres of the pylorus only, or even mostly in these cases. This has been shewn to be erroneous by D. J. Cunningham and others.

The remaining sections are, like the rest of the book, clear, interesting, and up to date. Some of the author's conclusions may, perhaps, be found fault with as rather too dogmatic; but these are not numerous, and will doubtless receive some amplification and modification in future editions. The illustrations are mostly well chosen and well produced. We have great pleasure in recommending Dr. Miller's book as one of the best of its kind, and as a sound and stimulating guide for students and practitioners who wish to acquaint themselves with the modern views on the medical diseases of children.

The Climatic Treatment of Children. By FRED. L. WACHENILIM, M.D.
Pp. 400. London: Rebman, Ltd. 1911. Price 6s. 6d.

THIS little work is written from an entirely American point of view, and is rather disappointing to the English reader. It deals shortly with climatology in general, and has chapters on the climatic treatment of normal children and that of constitutional disease, of disease of the viscera, and of scrofula and tuberculosis. Much the most important section is that which is concerned with temperate North America. This gives numerous interesting details regarding the climatic conditions of American health resorts. The chapter on European climates is less full, and it is evidently founded more on reading than on personal experience. In Great Britain we are told "the spring is considered unwholesome, on account of the frequent east winds which, coming from the Continent, are relatively dry;" and, again, "in the Scottish Highlands and in Cumberland we find over 100 inches (of rain) per annum, and in autumn these districts are fairly drowned in torrential rains." While we can perhaps recall times of disappointment when it would have given us pleasure to endorse these statements as they stand, it may be doubted whether they can be held to give an impartial and satisfying statement of the facts.

Radium, its Physics and Therapeutics. By DAWSON TURNER, B.A., M.D., F.R.C.P.(Edin.), M.R.C.P.(Lond.), F.R.S.(Edin.), Lecturer on Medical Physics, Surgeons' Hall, Edinburgh; Medical Officer in Charge of the Electrical Department of the Royal Infirmary, Edinburgh. Pp. x. + 86. Crown 8vo. London: Baillière, Tindall & Cox. 1911. Price 5s. net.

IN the few years which have elapsed since the discovery of radium, this wonderful substance has been extensively used in medicine and surgery. There is still much to learn as to its mode of action on living tissues and micro-organisms, and as to the diseases for which it may with advantage be employed; but enough has already been found out to establish its position as a most valuable therapeutic agent. The articles dealing with its use in medicine are scattered in various journals, and are therefore not easily accessible. Dr. Dawson Turner has been one of the first to obtain and use this precious substance in Scotland, and he has done good service to the profession by furnishing in book form this short and clear account of the physics and therapeutic uses of the new remedy. In the ten chapters of the book Dr. Turner tells how radium was discovered, explains some of its physical properties, and indicates how it may be employed in the treatment of disease. From his account we see that its chief value seems to be in the treatment of rodent ulcer, where it is more efficacious than

X-rays, but there are many other diseased conditions which yield to its action, such as, among others, various forms of angioma, warty growths, leucoplakia, tuberculous glands, and spring catarrh of the eyelids. The various ways in which radium may be employed for rodent ulcer and other conditions are detailed, and guidance is afforded with regard to dosage. Dr. Turner gives particulars of a number of cases treated by radium, and illustrates the more important of them with photographs before and after treatment.

We are confident that this book will do much to spread abroad a knowledge of the uses of radium as a healing agent, and we cordially recommend it to our readers.

Vicious Circles in Disease. By JAMIESON B. HURRY, M.A., M.D. (Cantab.), Ex-President, Reading Pathological Society. Pp. xiv. + 186. With Illustrations. London: J. & A. Churchill. 1911. Price 6s. net.

THE phrase, a vicious circle, is made use of by medical writers with more frequency than precision. It is defined by the author of the monograph before us as a "morbid process in which two or more disorders are so co-related that they act and re-act reciprocally on each other." The study of the pathological factors concerned in such processes will, it is claimed, unravel many a Gordian knot in obscure disease and be rewarded by increased accuracy of diagnosis and much gain to treatment.

The author is well equipped for his task by a wide acquaintance with both medical and general literature in many languages, ancient and modern. He has thus been enabled to bring together an astonishing number of quotations from a list of writers ranging from Euripides to Oliver Wendell Holmes, from Hippocrates to Osler. These quotations form an important feature of the book. They all bear more or less directly upon the point at issue, and most of them illustrate this by example.

The vicious circles of disease are described and classified with minute accuracy, recalling the topographical exactitude with which the great Florentine delineated the circles of his *Inferno*. Upon this secure foundation the author raises a superstructure of medical philosophy, from which he surveys the field of practice, and, in so doing, provides the reader with a fresh outlook upon the pathological happenings of daily experience.

The existence of vicious reciprocities in disease cannot be denied, but their exclusive contemplation may lead to unduly pessimistic conclusions. Nature is here represented not as a healing but as a destroying force. Her fateful influence is insisted upon with something of the inevitableness of Greek tragedy.

May we suggest that things are not so bad as they seem? Many of the instances given in this book refer to a period of disease when the defences of the citadel are already undermined and a fatal termination is approaching. It is true that we must all die, but it is equally true that all diseases are not fatal. The *vis medicatrix* is at least as potent and as often exercised as the *vis devastatrix*. Nature is not always such an unkind mother after all.

It would, however, be unfair to our author to suggest that he abandons us to absolute despair. He devotes his penultimate chapter to treatment, and indicates his panacea in the formula "Break the Circle."

A careful study of the facts and conclusions contained in this work will be of service to all those engaged in the practice of medicine, and may be expected to throw new light upon some of the dark places of disease and thus contribute to the realisation of the author's aspirations.

Pocket-Book of Treatment and Formulary. By RALPH WINNINGTON LEFTWICH, M.D. Pp. 348. London: Edward Arnold. 1911. Price 6s. net.

THE author of this small book has attempted a very difficult task, viz. to condense into small space a very large amount of information. In this pocket-book diagnosis is not outlined. The book deals with treatment and formulary under headings of so-called diseases, but as many of these are symptoms of a variety of pathological conditions, suitable treatment apart from diagnosis is not possible.

There are great differences in the quality of the articles. Some of them are admirable, thoroughly up to date, but a few, as for example that on dislocations, are not in line with modern methods. There are various omissions, as for example, under "Offensive Breath" no mention is made of ulcerative stomatitis, a not uncommon cause. Under "Faecal Accumulation" the possibility of requiring to break down hard masses in the rectum is not alluded to. Under "Diabetes Mellitus" the influence of worry and the necessity for removing, or at least for treating it, is not referred to. Under "Diarrhœa" it would have been prudent to enter a caveat in relation to the condition due to cancer, which is often described by patients as diarrhœa. "Atonic Dilatation of the Stomach" is dismissed with the statement that lavage may be unnecessary.

Notwithstanding several such omissions the pocket-book will prove a real help to busy men, provided that they bear in memory that symptomatic treatment apart from correct diagnosis is unscientific and may lead to harm. Many of the articles are very suggestive, and indicate more than one line of treatment. The prescriptions are evidently the outcome of a large experience.

Practical Treatment. Edited by Drs. MUSSER and KELLY. Vols. I. and II. London: W. B. Saunders Co. 1911. Price 75s.

THIS system of practical medicine is to consist of three volumes. Two have now been issued. Like most other compendia of the present day, the work is from the hands of a number of contributors. It is edited by Musser and Kelly of Philadelphia.

Volume I. deals with therapeutic measures from a general standpoint, and includes all the recent advances and their application to suitable diseased conditions.

Important chapters are assigned to diet, serum therapy, electrotherapy, and radiotherapy. These are particularly good, indicating, as they do, concisely and clearly for the physician the use of these modern methods. Up to this time they have been difficult to follow and apply, the information being accessible only from various scattered sources, as our knowledge has been gradually added to with the advances made.

Volume II. is entirely occupied with the treatment of conditions of the cardio-vascular system and infectious diseases.

Chapter I. on cardio-vascular diseases is by Clifford Allbutt, and is written in his usual elegant and readable style. The most important chapter in this volume is on the treatment of tuberculosis, which has 120 pages devoted to it. An excellent account is given of the most recent attempts to deal with this scourge. Treatment by tubercular and anti-tuberculous serums is fully discussed, and the conditions distinctly laid down under which such treatment should be attempted. This system should stand as one of the best guides to treatment for some time to come.

The Wassermann Sero-Diagnosis of Syphilis in its Application to Psychiatry.

By FELIX PLAUT, M.D., Munich. Authorised Translation by SMITH ELY JELLIFFE, M.D., and LOUIS CASAMAJOR, A.M., M.D. Pp. 188. New York: The Journal of Nervous and Mental Disease Publishing Company. 1911. Price \$2.

THIS is a very excellent monograph confined entirely to the subject of the use of sero-diagnosis applied to the serum and spinal fluid as a means of differential diagnosis in psychiatry. The first four chapters are devoted to the history of the development, nature, technique, and specificity of the Wassermann reaction. The constitution of the immune body and antigen are fully discussed, and the author suggests three theories as an explanation of the reaction. Plaut considers the original Wassermann technique to be the most reliable, namely, artificial rabbit hæmolytic serum, guinea-pig serum, and for antigen watery extract of syphilitic liver, which he has found infinitely the most delicate antigen. The necessity for great care in the technique is emphasised.

and he recommends that with each experiment a double and single amount of control extract should be used, and that known sera should be kept to estimate the retarding power on hæmolysis of any new extract. The possible explanation of the various results obtained by different workers may be due to careless technique and the non-use of aqueous syphilitic extract as antigen. The clinical specificity of the reaction is fully established, for in 126 apparently normal sera only 5, or 4 per cent., were positive, and all the spinal fluids were negative.

The fifth chapter opens with the investigation of the reaction in syphilis without involvement of the central nervous system. The spinal fluid gave a negative reaction in every case, which is a most significant fact; the serum reaction was positive in 79 per cent. of the cases; 19 sera were negative, and of these 16 were cases of latent tertiary syphilis. Plaut concluded, from the results he obtained, that a positive reaction is a sign of general infection. It may, however, disappear from the serum when the active symptoms of syphilis subside, and it is not always present in the serum of persons who have contracted syphilis. So long as this reaction is positive it is possible that syphilis exists in the body. It was found that treatment alters a positive reaction to a negative one, and he puts forward the hypothesis that patients who have been thoroughly treated, and whose sera still react, are those who are likely to develop meta-syphilitic conditions.

The differential diagnosis of general paralysis from psychoses associated with trauma, alcohol, the manic-depressive group, cerebral syphilis, and tabes with psychoses are fully investigated. Records of clinically difficult cases are given, with notes of the pupillary reactions and cytological findings in the spinal fluid. The author found the sera in general paresis positive in 100 per cent. and the spinal fluid in 94 per cent. The reacting substance appears in both fluids in the early stage of the disease, and the intensity of the reaction bears no relation to the clinical type of the disease. Usually the two fluids were equal in their power of deviating complement; occasionally the serum would be stronger, but rarely was the spinal fluid found to be more intense. Plaut has the largest percentage of positive reactions on record in psychiatry.

In cerebral syphilis the conditions are altered. The serum may be, and commonly is, positive, establishing the existence of syphilis, but the reaction of the spinal fluid is usually negative. In slowly progressing and atypical cases of paresis with a positive serum and a spinal fluid negative or partial, it is still doubtful whether they are or are not cases of cerebral syphilis. The author formulates the following:—"That the cases of cerebral syphilis where the spinal fluid reacts positive are just as rare as those cases of paresis in which they react negative."

Tabes resembles paresis both in the reaction of serum and spinal

fluid, although the percentage of positive reactions is not so great. The fact that the spinal fluid possesses the reacting substance in so large a percentage of cases in tabes and paresis places them apart from syphilis in the conventional sense, as in syphilis when there is actual involvement of the nervous system the fluid does not usually possess this reaction. The usefulness of the reaction when positive in juvenile paresis, cerebral palsy of children, imbecility and slight weakmindedness is undoubted, for by establishing the presence of syphilis it enables anti-syphilitic treatment to be employed. Family histories were investigated, and even when syphilis was absolutely denied by the parents a positive serum reaction in them revealed the taint in many instances.

The last chapter deals briefly with a comparative investigation of the reaction and cytology of the fluid. The counts were made by Fuchs-Rosenthal method, and the limits 6 to 9 cells per c.mm. borderland, 10 cells and upwards pathological, appears to us to be placed rather too high. A small percentage of non-syphilitic cases gave a cytological reaction. Thirteen syphilitic cases gave an increase of cells, and three of these were latent tertiary cases with no known involvement of the nervous system. In all the cases of general paralysis there was an increase of cells, but in five cases the increase was not pathological (above 10), yet in these cases the Wassermann was positive, and Plaut considers that the reacting substance may appear in the spinal fluid before the cells. Most cases of tabes and cerebral syphilis showed a cell increase. There is no connection between cells in the spinal fluid and the production of a Wassermann reaction.

In order to appreciate thoroughly the extent of the investigation, the clinical records, and the extensive bibliography, the book should be read. There are one or two obvious small errors, such as 79 per cent. "negative," and the converse on p. 42.

La Sérothérapie. Par M. EMM. POZZI-ESCOT. Pp. 92. Paris: Jules Rousset. 1911. Price 1 fr. 50.

IN this little volume Professor Pozzi-Escot has endeavoured to give a popular account of modern serum treatment. While in such a work originality is not to be looked for, it gives an excellent general idea of the attempts which have been made to apply serotherapy to different infectious diseases and of the successes which have in certain instances been obtained. It may be recommended not only to the layman who is anxious to obtain some rough knowledge of the subject, but also to students and practitioners who are unable to find the time to read more advanced treatises.

A Clinical Atlas of Sectional and Topographical Anatomy. By RICHARD J. A. BERRY, M.D.(Edin.), M.D.(Melb.), F.R.C.S.(Edin.), F.R.S.(Edin.), Professor of Anatomy in the University of Melbourne. Pp. 13 of Text, and 60 full-page Coloured Plates. Edinburgh and London: William Green & Sons. 1911. Price £2, 2s. net.

THE main object of this atlas, as set forth by the author, is to enable various anatomical structures to be located quickly and accurately. All the sections figured have been made through planes which can be readily ascertained on the living body, and the inclusion of a centimetre scale with most of the plates is of great value. The reconstruction figures are not only instructive to the anatomist, but should prove of real benefit to the surgeon. The sections have been cut with the greatest care; the subjects were hardened by repeated injections of 20 per cent. formaldehyde and, just prior to sectioning, by freezing. The plates are all reproduced from photographs. The technique and the general scheme of the work are highly praiseworthy, while the amount of labour must have been enormous.

The author is too sanguine in claiming that, by reference to the atlas, "any structure can be quickly and accurately transferred to its correct position in the living subject." Although he admits that the age of the subject may produce variations, Professor Berry does not mention the possibility of error due to injections of 20 per cent. formaldehyde solutions. The examination of Plates 33-39 will at once show the action of this hardening agent on the abdominal muscles, and it is incredible that this condition has had no effect on the disposition of the abdominal viscera. This, as well as the individual variation known to exist, probably accounts for the difference in level of the hepatic and splenic flexures of the colon in the transverse and sagittal sections, which were made on different subjects. A comparison of the liver, spleen, and other structures, shown in sections from different subjects, will cause the reader to pause before he accepts the author's statement, quoted above, in its entirety.

Very few errors have crept into the work, but it should be pointed out that, in Plate 57, a wrong impression is given of the relationship which the vas deferens bears to the deep epigastric artery, while in Plate 59 the words "Ureter" and "A. uterina" have been transposed. Omissions are also few in number, but one is surprised to notice that the inferior maxillary division of the trigeminal nerve is not figured in the transverse sections of the head, and that neither in the transverse nor in the sagittal sections of the abdomen is the vermiform appendix labelled.

Some of the plates are a little disappointing. There is a lack of definition about some of the structures which frequently leaves the observer in doubt, and the colour-scheme chosen is not sufficiently dis-

tinctive. It is a pity that the sagittal sections were reproduced as single plates, for the amount of reduction necessary has robbed them of some of their value. It is highly probable that most of the defects are due to the use of photography, which is not so well suited to this class of illustration as Professor Berry would have us believe. At the same time it must be remembered that really satisfactory reproductions are extremely difficult to obtain in anatomical work, and, despite the defects, the atlas is certain to be of great use to those to whom the subject of sectional topographical anatomy, set forth in a practical and scientific manner, appeals. The book is substantially and handsomely bound, and will amply repay a searching and critical study.

Collected Papers by the Staff of St. Mary's Hospital Mayo Clinic, Rochester, Minnesota, 1905-1909. Philadelphia and London: W. B. Saunders Co. 1911.

ALTHOUGH all the papers included in this collection have already appeared in various journals and Transactions of societies, and are doubtless familiar to our surgical readers, the handsome volume in which they are now incorporated, furnished as it is with a detailed index, will be welcome as a convenient work of reference.

The work done at the Mayo clinic indicates the high-water mark of American surgery, and we cordially welcome this record and commend it to our readers.

A System of Syphilis. Edited by D'ARCY POWER, M.B., F.R.C.S., and J. KEOGH MURPHY, M.C., F.R.C.S.; with an Introduction by Sir JONATHAN HUTHINSON, F.R.S. Vols. IV., V., VI. London: Henry Frowde. 1910. Price £2, 2s. per Vol.; £10, 10s. per set of 6 vols.

THIS exhaustive work has now been completed, and the favourable opinion we were able to offer of the earlier volumes may be repeated regarding those now before us.

The fourth volume differs from the others in respect that it is from the pen of a single author, and deals with a single aspect of the disease, namely, syphilis of the nervous system. No higher authority could have been selected to deal with this subject than Dr. F. W. Mott, and he has presented us with a monograph of the highest scientific and practical value.

The fifth volume comes fully up to the high standard of the previous volumes. It is divided into four sections: 1. Affections of the Skin in Syphilis. 2. Ocular Syphilis. 3. Aural Syphilis. 4. Syphilis of the Upper Air-Passages.

The Affections of the Skin are described by Phineas Abraham, M.D., and Haldin D. Davis, M.D. All the different types of eruption in the secondary and tertiary stages of acquired syphilis and in congenital syphilis are very fully described. A special chapter is devoted to differential diagnosis, and this difficult part of the subject is very carefully written, but from a practical point of view it would have been better had the authors given the differential diagnosis of each kind of rash immediately after its description. This section of the volume is illustrated by thirty plates, the majority of which are coloured. For the most part these coloured plates are good, but some are slightly too red.

The section on Ocular Syphilis is by C. Devereux Marshall, F.R.C.S. ; that on Aural Syphilis by Ernest West, F.R.C.S. ; and that on Syphilis of the Upper Air-Passages by St. Clair Thomson, F.R.C.S. Each of these sections is treated in an exhaustive and thorough manner and well illustrated by coloured and half-tone illustrations.

The last volume is devoted to syphilis in relation to the public services, the Navy and the Army. It is particularly in relation to these that a graphic estimate of the prevalence of this disease and of its disabling effects can be got, and this volume brings this before the reader in a most interesting and instructive manner. Until quite recently, about five years ago, the incidence of venereal disease in the Army was a disgrace to the nation, and the disparity between the British Army and the Continental Armies was wholly discreditable to the former. Now fortunately venereal disease has diminished to an extraordinary extent, and the diminution is due not alone to the ungrudging efforts of the officers of the R.A.M.C. but also to the desire of the War Office and general officers to make the lives of our soldiers more attractive and more hygienic. Lieut.-Colonel C. H. Melville in his article, which extends to 105 pages, reviews the history and epidemiology of syphilis in the more important armies, and discusses the question of prevention in a fair and judicious way. He is against any form of State supervision, and pleads for the better education of the soldier and for a high ideal in his life. This is the view advocated by most authorities in civil life, and undoubtedly much of the improvement which has been attained in the Army is due to the interest taken in the men by their company officers at the instigation of those in the higher commands. It is recognised to-day that the physical health of the soldier depends very much on his moral qualities and hygienic surroundings.

In other portions of this volume the pathology and treatment of syphilis are considered, and the authors have written articles which are abreast of modern views. The value of continuous treatment and the advantages of intra-muscular injection are especially referred to, and the best means of applying these detailed.

The chapters relating to syphilis in the Navy are of special interest, and that by Dr. Fiske, Surgeon U.S. Navy, more particularly on prophylaxis, which since 1908 has had official departmental approval, is important and worthy of careful consideration.

Altogether this volume well maintains the high standard of the previous five volumes, and the editors, contributors, and publishers are to be congratulated upon the completion of a standard work on this engrossing and most important disease. It is the most comprehensive and up-to-date work on the subject, and no public medical library should be without it.

Duodenal Ulcer. By B. G. A. MOYNIHAN, M.S.(Lond.), F.R.C.S.
Pp. 378. Philadelphia and London: W. B. Saunders Co. 1910.
Price 18s. net.

THE advantage of studying "pathology in the living" rather than on the post-mortem table, and of observing the earlier phases of morbid conditions in the course of surgical operations, rather than their terminal stages after they have proved fatal, could not be better illustrated than by comparing the state of our knowledge of duodenal ulcer and its complications to-day with what it was a decade ago. It is not claiming too much for surgeons to say that to them it is due that what was considered a comparatively rare and somewhat vague disease ten years ago is now recognised to be a common affection, the diagnosis of which, to quote Mr. Moynihan's words, "is made with a degree of accuracy that is not exceeded in the case of any other abdominal disorder."

No worker in this field has done more to elucidate the subject than Mr. Moynihan, and his monograph now before us presents a complete and authoritative exposition of what is known to-day regarding duodenal ulcer.

After a short résumé of the history of the subject a discussion of duodenal ulcer in cases of burns and scalds is entered upon. The author believes in the occurrence of this condition, but considers it extremely infrequent, as is evidenced by the fact that in twenty years not a single case has been observed in the post-mortem room of the Leeds Infirmary, where cases of burns are frequently admitted. Uræmic ulcer, tuberculous ulceration, and melæna neonatorum are next discussed before the consideration of chronic duodenal ulcer is entered upon. This subject is fully considered in all its bearings, the author's extensive experience being supplemented by references to the observations of other surgeons.

In an appendix, extending to 111 pages, a detailed statement of all the cases operated on by the author to the end of 1908 is furnished. These number 186.

NOTES ON BOOKS.

Dr. J. Ryland Whitaker's *Anatomy of the Brain and Spinal Cord* (E. & S. Livingstone) has been in such demand, and has been so difficult to obtain during the past few years, that students will be grateful to Dr. Whitaker for the new revised fourth edition. The plates are much improved, and there is some slight increase in the letterpress. It is essentially a students' book, and is written in an easy, lucid style that renders it very attractive. The past sale of the volume is sufficient proof of its popularity, and this alone should compensate Dr. Whitaker for the time and labour he has spent in bringing the new edition up to date.

The Surgery of the Diseases of the Appendix Vermiformis and their Complications, by William Henry Battle, F.R.C.S., and Edred M. Corner, M.A., M.B., M.C., F.R.C.S. (Constable & Co.), appears in the second edition in enlarged form. It fully maintains its reputation as an excellent and succinct account of the anatomy, pathology, symptoms, and treatment of appendicitis. The subject-matter is throughout treated on a clinical rather than a pathological basis, and in this respect it is of special value alike to the physician and the practical surgeon. In this edition the illustrations have been increased in number, and they are well chosen and clearly reproduced. In accordance with the spirit of the age, a chapter is added on the relation of appendicitis to selection for life insurance. The authors suggest that in doubtfully acceptable cases a definite proportion should be subtracted from the policy if the cause of death is connected with disease of the appendix.

Dr. Cattell begins the fourth volume of *International Clinics*, twentieth series, 1910 (J. B. Lippincott Company), with a very interesting paper on Arsenobenzol ("606") in the treatment of syphilis. He gives explicit directions how to make a solution of the yellow powder suitable for injection. These directions are most valuable to any practitioner at a distance from the practice of an infirmary.

There are many other articles interesting and useful, such as the methods of examining the blood, of greatest use to the general practitioner, by Professor Barker, functional tests of cardiac inefficiency by Hirschfelder, cholera nostras and Asiatic cholera by Dr. Klein of New York, in which he shows that the cholera bacillus was carried not only by water, milk, ice, uncooked vegetables and fruit, but also by flies and especially ants, the dirty hands of cooks, and even by money, especially pfennige and dimes, which had to be disinfected by the application of strong acetic acid.

Professor Glaister gives an excellent article on the law respecting the compensation to workmen for accident in Great Britain and its operation. The volume is finished by a very interesting article on wounds by firearms by Dr. Wadsworth, of Philadelphia.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL NOTES AND NEWS.

THE death of Dr. Joseph Bell is a sore blow to all connected with the *Edinburgh Medical Journal*. It is nearly forty years since he took over the editorship in succession to Dr. George Balfour. The change came about suddenly, and he used to tell his successors, with a humorous twinkle in his eye, about the first number he edited. There were some twenty pages of type standing, no copy, and only ten days till the *Journal* was due. He set to work. He wrote articles below his name and others anonymously; he wrote letters to the editor and answered them, all under pseudonyms; and he accomplished the since unknown feat of publishing notices of *all* the books that had been sent in for review.

He edited the *Journal* till 1897, when the stream of medical journalism in Edinburgh for a time divided. He threw his support on the side of the *Scottish Medical and Surgical Journal*, of whose Directors' Board he was the first and only Chairman. When the stream flowed together again in 1908 no one rejoiced more, and no one was more responsible for the happy union than he, and he was unanimously chosen Chairman of the reconstructed Board. It will not be easy to fill his place.

He was a tower of strength to the editors, always ready with his counsel, and never too busy to go into any matter on which they sought his help. If there was a review which seemed unnecessarily harsh he could with a few scratches of his pen remove the venom and yet leave the meaning unchanged; if there was some delicate question of policy to decide he was always ready to advise and never to dictate, and his advice was always sound.

He would never write editorials, but he was almost always ready to write obituaries. Within twenty-four hours of our request there would be dropped into our letter-box a notice that would have taken most of us a week to prepare. He knew everybody, where he was born, something about his family history, whom he married, the whole course of his professional life, and he had the happiest knack of referring to all these things in just the right number of well-chosen words. The future editors of the *Journal* will often miss Joe Bell.

The late Colonel Warburton, M.D., C.S.I. As we write, it is something less than three months since we chronicled a festive gathering of the friends of Colonel Warburton to bid him farewell on the occasion of his relinquishing the post of Superintendent of the Royal Infirmary, which he had held with so much acceptance for a period of twelve years. It is now our melancholy duty to record his death, which took place at Lowestoft on 18th October.

To those most intimately associated with the Colonel it was known that the strain of his official duties was beginning to tell on his health, but it was hoped that the relief from care, and a sojourn in Italy, to which he looked forward, would restore him to his wonted strength and vigour. To these, and to a wider circle beyond, his death brought a great disappointment.

A native of Canada, a graduate of Edinburgh University, a distinguished member of the Indian Medical Service, and the administrative head of a great Scottish hospital, Colonel Warburton acquired a wide experience of men and affairs, from which we in the Edinburgh school derived much benefit.

Of his work in India it is not for us to speak. Those who were in a position to judge estimated it highly; and it was appropriately recognised when, in 1899, he was made a Companion of the Order of the Star of India, with its noble motto: "Heaven's Light our Guide."

During his tenure of office as Superintendent of the Infirmary many important changes were effected. The Surgical Out-Patient Department was reconstructed and organised on a new basis; the Medical Out-Patient Department was rebuilt; the new pavilions in which the Ophthalmic and Aural Departments are housed were built and furnished; the Electrical and Balneological Departments were brought abreast of modern requirements; the Pathological Department was reorganised; and the Surgical charges in the hospital were rearranged. Less obvious but not less important work in connection with the housing of the nurses, drainage, kitchen accommodation, and other domestic matters was also carried out.

It would be going too far to ascribe the initiative in all these movements to the Colonel, but it may truthfully be said that on him fell the brunt of the anxiety and labour of seeing them carried into effect.

The esteem in which Colonel Warburton was held was admirably voiced by the Chaplain to the Infirmary (the Rev. R. Henderson, M.A.) in the address he delivered at the funeral service held in the Chapel of the Infirmary on 21st October. Mr. Henderson said: "It is difficult, I am sure, for us to realise that we are called on to-day to hold a Memorial Service for one who, but a few weeks ago, was performing all the duties of Superintendent amongst us to the last day of his tenure of office. We knew that its burdens had been pressing more heavily

upon him than in earlier years. We knew that in later months the consciousness of failing strength had led him to seek release from office; but to those who saw him last July it did not seem too much to hope that rest and leisure would give him not only months but years of well-earned enjoyment of congenial companionship and interests. But in God's Providence, wise, kind, as we ever believe it is, that was not so to be. And now we meet, in love and sorrow, to remember affectionately the familiar presence we cannot again hope to see amongst us. This Institution has been singularly fortunate in the high character and genial personality of those who have presided over its daily work. Men of strong nature they have been, accustomed to responsibility, experienced in the control of great organisations. These qualities they have shown here; but by kindly courtesy and considerateness for all under their care, they have diffused through all departments of the house a tone of graciousness and friendliness which distinguishes this hospital beyond most.

"Of these fine qualities of gentlemanly courtesy and generosity of spirit Colonel Warburton was an eminent example.

"With love and reverence we pay him this last token of respect, praying God that the memory of his spirit and example may linger long amongst us to inspire to the best deeds."

Gerhard Leopold,
Dresden,
24th February 1846 to
12th September 1911.

THE death of this celebrated obstetrician and gynæcologist from heart failure is a great loss to the specialities of which he was such a distinguished ornament.

The successor of von Winckel, who still survives, he passed all his life as an investigator and teacher in the Frauen-klinik which first claimed him.

Leopold was a most industrious and original observer, and his papers from the very first attracted attention and furthered the progress of the subjects he investigated. Those on the structure of the uterine mucous membrane in all its phases still hold the field as accurate and illuminating, and the same may be said as to his atlases of the sectional anatomy of pregnancy and labour. On operative work he wrote solidly and effectively, and his work on Sigault's operation, on Cæsarean section, on hysterectomy for fibroids have been of great value.

The mere enumeration of his principal writings occupies four pages of the current *Monatsschrift für Geburtshilfe und Gynäkologie*, and there are probably many more not given.

A few months before his death Leopold was raised to the dignity of Geheimrat, and thus in Richter's words, "So Schloss mit reichen Ehrungen das Leben eines rastlos tätigen Mannes, dessen Wirken und Schaffen der Menschheit viel Gutes gebracht und dessen Werke ihm einen Ehrenplatz unter den Hervorragendsten seines Zeitalters sichern."

**Presentation to
Professor MacEwan.**

ON 5th October a large meeting was held in the Board Room of Dundee Royal Infirmary, when Professor MacEwan was made the recipient of a handsome silver tea-service and a large silver tray, bearing the inscription, "Presented by the present and past members of the Board of Directors to Professor David MacEwan, M.D., in recognition of his valued services during forty-three years to the Dundee Royal Infirmary. September 1911."

Mr. T. H. Smith, Chairman of Directors, who presided, stated that Dr. MacEwan was appointed Joint House-Surgeon on 9th July 1868, and that he had acted in that capacity and then as Visiting Surgeon, except for two short intervals, until his resignation, which took place on 30th September 1911. In making the presentation Mr. Smith spoke of the skill, ability, and cheerfulness with which his work had been done during that long period, and he expressed the hope that his kindly advice would be available in the future.

In thanking the Directors for their gift Professor MacEwan referred to the many changes that had occurred during his term of office. Now as many operations were performed in a week as were done in a year when he commenced work. The increase of patients was quite out of proportion to the increase of population, this being due to the greater confidence the people of Dundee had now in their Infirmary. The most important event that had happened during his career as surgeon was the founding of the Medical School in Dundee. This had proved a mutual advantage to student and patient. With the vigilant eye of the student always upon him the teacher could not but exert himself to do his best for the patient.

MR. C. W. CATHCART has been appointed Surgeon to the Royal Edinburgh Hospital for Incurables in succession to the late Mr. Joseph Bell.

DR. MACKENZIE JOHNSTON has been re-elected and Dr. George Berry elected members of the University Court.

**The Dr. Jessie
Macgregor Lecture.**

IN accordance with the conditions laid down by the trustees of this Fund, Dr. Agnes Ellen Porter, to whom the prize was awarded this year, delivered a lecture, entitled "A Short Survey of Immunity in Tuberculosis," in the Anatomical Department of the University of Edinburgh on the 29th September. The Treasurer of the Royal College of Physicians (Dr. Norman Walker) introduced Miss Porter, and referred to the high standard of work submitted by candidates for the prize. The next award will be made in 1914.

THE SPREAD OF BACTERIAL INFECTIONS FROM THE NASAL AND NASO-PHARYNGEAL CAVITIES BY WAY OF LYMPHATIC CHANNELS.*

By A. LOGAN TURNER, M.D.(Edin.), F.R.C.S.E., F.R.S.E.

Bacteriology of the Healthy Nasal and Post-Nasal Cavities.—It will not be out of place to make a brief reference to the bacterial flora of the normal nasal, naso-pharyngeal, and accessory nasal cavities, and to draw attention to the bacteriology of the common catarrhal conditions of the upper respiratory passages. In spite of certain conflicting opinions regarding the relative prevalence and virulence of micro-organisms in the healthy nasal passages, the investigations of Park and Wright, St. Clair Thomson and Hewlett, Hasslauer, Viollet, Paulsen, Strauss, von Besser, Lewis and Logan Turner and others have clearly demonstrated their existence under normal conditions.

In the researches of Lewis and myself¹ twenty-six specimens were examined from sixteen persons and only three were sterile. Thirteen were mono-organismal, nine showed two varieties of organism, while in one specimen a combination of three varieties of bacteria was met with. The pneumococcus was present in four, the micrococcus pyogenes in thirteen, and streptococci in six specimens. Other organisms such as the bacillus of Hoffmann, Friedländer's bacillus, *B. mesentericus*, *B. proteus*, and *B. aureus* were also isolated. In only two of the healthy cavities were the organisms pathogenic, the streptococcus pyogenes in one proving fatal to a rabbit in fourteen days. Allen² examined twenty normal noses and none of them were sterile; the micrococcus pyogenes var. albus and aureus were isolated in fifteen; Gram-cocci of the pseudo-catarrhalis group were found in four.

With regard to the post-nasal space, we find that C. E. West in his recent researches upon the bacteriology of chronic naso-pharyngeal catarrh, which will be referred to presently, formed the opinion that the bacterial flora in health differed very little from that found in chronic catarrh. Reference will be made later to the occurrence of the tubercle bacillus in the normal nasal cavities.

The Healthy Accessory Sinuses.—Bacteriological investigation of

* This paper was read at the opening of a discussion at the Third International Laryngo-Rhinological Congress held in Berlin, August 1911.

the healthy accessory sinuses does not seem to have been carried out during life, the difficulty of doing so without contaminating the swab employed being obvious. Törne³ has examined the frontal and maxillary sinuses in thirty-six cadavera; in twenty-two the cultures were made within two and a half hours of death, and in all of them the sinuses were found sterile. Of the remaining fourteen cases examined from three to twenty-five hours after death, seven were still sterile and seven contained bacteria. There is thus evidence to show that these sinuses at any rate are free from bacteria during life. E. Fränkel⁴ had previously examined the normal accessory sinuses, some within eight to ten hours, and all within twenty-four hours, after death. In twenty-eight cadavera thirteen were quite sterile, while of the remainder some contained one, others several forms of bacteria. The pneumococcus and varieties of the micrococcus pyogenes were found. Fränkel concluded that these cavities may contain organisms in their normal condition during the life of the individual, but he does not appear to have examined them bacteriologically so recently after death as did Törne.

Bacteriology of the Nasal and Post-Nasal Cavities in Acute and Chronic Catarrhal Conditions.—Allen² has examined the nasal mucus in forty cases of acute catarrh or "common" cold. The micrococcus catarrhalis was isolated in nineteen, the bacillus coryzae segmentosus in eighteen, and the bacillus of Friedländer in fourteen. The bacillus influenzae was only once found, but during the periods at which these examinations were conducted no influenzal epidemic had visited the district in which the individuals were living. Walter⁵ has tabulated one hundred cases of acute, subacute, and chronic rhinitis. The micrococcus pyogenes var. albus, citreus, and aureus occurred in 56 per cent.; the bacillus coryzae segmentosus of Cautley in 35 per cent.; and the micrococcus catarrhalis in 20 per cent. Friedländer's pneumo-bacillus and the pneumococcus of Fränkel were each regarded as causal organisms in 7 per cent. The B. influenzae was never found though an influenzal rhinitis was prevalent in the district. With regard to our own observations,¹ thirteen specimens were examined from eight cases of acute nasal catarrh and one of chronic post-nasal catarrh. The streptococcus pyogenes appeared to be the exciting cause in six, and the micrococcus pyogenes in two, of the acute cases. The pneumococcus was only once found. The bacillus of Hoffmann, the pseudo-diphtheria bacillus, and the B. mesentericus were amongst the other organisms isolated.

Bacteriology of Chronic Naso-Pharyngeal Catarrh.—C. E. West⁶ has given us the result of his recent investigations on the bacteriology of fifty cases of chronic post-nasal catarrh. The cases were essentially of a chronic nature, and had been under observation for a considerable period of time, the majority of them having used an alkaline naso-pharyngeal wash for weeks and even months. The sparsity in the number of bacterial types was a feature of the investigation. The pneumococcus occurred more frequently than any other organism, being found in no fewer than 70 per cent. of all the cases, occurring in pure culture in 36 per cent. Streptococci were isolated in 24 per cent. of the plates, being the predominant organism, however, in only two cases, and never in pure culture. In the majority of the cases the streptococcus salivarius was the type observed. The micrococcus pyogenes var. aureus occurred in large numbers in 26 per cent., usually associated either with the pneumococcus or the streptococci. On several occasions a coccus morphologically indistinguishable from the meningococcus occurred in considerable numbers, in one instance being found in almost pure culture. The micrococcus catarrhalis was only isolated four times, *i.e.* in 8 per cent., while Friedländer's pneumo-bacillus occurred in 12 per cent., being the predominant organism in half of these.

Goure,⁷ Lartigan and Nicoll⁸ have examined the secretion lying upon the surface of adenoid vegetations after their removal by operation. A variety of organisms were cultivated from it—the streptococcus pyogenes, the micrococcus pyogenes var. albus and aureus, the pneumococcus and various diplococci being obtained.

Bacteriology of Inflammatory Conditions of the Accessory Nasal Sinuses.—The following observations are from our own work⁹ and from some hitherto unpublished cases, for which I am indebted to my friend, Dr. F. Esmond Reynolds. In twenty-two cases of acute and chronic fronto-ethmoidal sinus suppuration, which were operated upon, the pneumococcus was isolated in eight, or 36 per cent.; the streptococcus pyogenes in nine, or 40 per cent.; and varieties of the micrococcus pyogenes, albus, aureus and citreus flavus in ten, or 45 per cent. A bacillus closely resembling the influenzal bacillus occurred in one case. In forty-three cases of maxillary sinus inflammation the pneumococcus was present in thirteen, or 30 per cent.; the streptococcus pyogenes in thirty-three, or 76 per cent.; and varieties of the micrococcus pyogenes in thirty-four, or 79 per cent. The B. influenzae was isolated in one, the tubercle bacillus in one and the micrococcus catarrhalis in two.

It is obvious, therefore, from the brief foregoing account that a variety of micro-organisms may be found in the healthy nasal and post-nasal cavities of most individuals, and also in the same cavities and in the accessory nasal sinuses of many persons who are apparently in the enjoyment of excellent health but who are at the same time suffering from a chronic catarrhal or muco-purulent inflammation of the mucous membrane of their upper respiratory passages. The chief organisms which are found and which demand our attention are the pyogenic cocci, the pneumococcus, the micrococcus catarrhalis, the influenza bacillus, the meningococcus and the bacillus tuberculosis. In the healthy upper air-passages the bacteria are frequently in smaller numbers, in pure culture, of lower vigour, and of little or no virulence as compared with the organisms which are present in the inflammatory conditions. In the latter they grow with vigour in subcultures and are frequently pathogenic to animals. From a variety of causes, however, such as debility, chills, traumatism, diminishing the tissue resistance, or from the introduction of a fresh organism, bacteria previously quiescent or avirulent may become active and give rise to acute infections.

General Scheme of the Investigation.—In the following table I have indicated the various organismal infections which may have a primary focus in the nasal and naso-pharyngeal cavities, and which will now be considered. It has already been shown that the organisms which produce them may be cultivated from these cavities in their healthy state or in simple catarrhal conditions. Although it is possible to demonstrate in some instances the lymphatic channels as pathways of infection, in other conditions again we cannot do more than assume that the lymphatic vessels may be the avenues along which the organisms are carried to neighbouring structures.

A. From the nasal and naso-pharyngeal cavities to the cerebro-spinal meninges—

- (a) Suppurative meningitis (pyogenic organisms).
- (b) Influenzal meningitis (Pfeiffer's bacillus and allies).
- (c) Pneumococcal meningitis (the pneumococcus).
- (d) Epidemic cerebro-spinal meningitis (the meningococcus).
- (e) Acute poliomyelitis.
- (f) Tuberculous meningitis (bacillus tuberculosis).

B. From the nasal and naso-pharyngeal cavities to the cervical lymphatic glands—

Glandular enlargement and pulmonary disease (bacillus tuberculosis).

While the chief function of the various meningeal spaces with the fluid contained within them has been long regarded as serving as a protection to the brain against alterations in pressure, anatomists in more recent times have looked upon them as lymph spaces. Schwalbe first demonstrated by injection of the subdural space paths of communication between it and the olfactory mucous membrane, the perilymphatic space of the labyrinth, and the perichoroidal space. Key and Retzius by injecting the same region were able to follow the injection into lymphatic vessels, which left the skull through the jugular foramen and carotid canal. They were also able to inject from the subdural space lymphatic vessels in the nasal mucous membrane. Flatau¹⁰ was able to inject the lymphatic vessels of the naso-pharynx from the subarachnoid space. Cuneo and André¹¹ have succeeded in young human subjects in injecting a lymphatic network in the pituitary membrane from the meningeal spaces, the vessels traversing the cribriform plate by small canals which are independent of the small olfactory nerve branches. This lymphatic network would appear to belong exclusively or almost exclusively to the olfactory region, and in this way resembles the similar extensions into the inner ear and the globe of the eye.

Our knowledge of the arrangement and distribution of the lymphatic apparatus of the accessory sinuses is still very meagre, and we are unable to give any descriptive account of them.

A. NASAL AND POST-NASAL CAVITIES TO THE CEREBRO-SPINAL MENINGES.

The number of cases of intra-cranial complication—meningitis, abscess, and sinus thrombosis—which have followed primary inflammation and suppuration in the nasal cavities and their accessory sinuses now form a fairly extensive series in literature. While the possibility of extension of the inflammation by way of lymphatics has been frequently considered, there can be no doubt that these structures probably play only a subordinate part as avenues of infection between the nasal cavities and the cranial contents. The difficulty in demonstrating anatomically

a lymphatic connection between the upper air-passages on the one hand and the cranial cavity on the other naturally increases our difficulty in proving the passage of micro-organisms by such a route. Moreover, both on the operating-table and in the post-mortem room it has been so frequently shown that infection spreads in the majority of cases as a result of a carious or cario-necrotic condition of the contiguous bony walls of the adjacent cavities or after complete destruction and perforation of the same. In other cases, again, the venous channels which pass directly through the adjacent walls or indirectly from the nasal sinuses through the orbit by way of the ophthalmic veins to the cavernous sinus constitute another pathway of infection. When neither macroscopic nor microscopic evidence of any of these avenues can be found, it may then be legitimate to assume that the lymphatics, if such exist, have been responsible for the propagation of the infection to the brain and its coverings. We have endeavoured in the following description to analyse the evidence in favour of the latter route of infection in meningitis.

(a) *Pyogenic or Suppurative Meningitis*.—Examination of the monographs of Dreyfuss and Gerber, who deal at great length with the intra-cranial complications of nasal and accessory sinus suppuration, shows how scanty are the references bearing upon lymphatic infection. The former quotes the cases of Quinlan and Wagner in which death from meningitis followed the application of the cautery to the nasal mucous membrane. As no post-mortem examination was made in either case, direct evidence as to the path of infection is wanting, but the lymphatic or venous channels may offer the possible explanation, as death followed rapidly upon the operation. Death from meningitis has followed removal of nasal polypi, and of the middle turbinated bone in patients suffering from ethmoidal suppuration, and more than one fatal result from a similar complication has occurred after submucous resection of the nasal septum in nasal cavities devoid of any suppurative focus. I have been unable to find any detailed post-mortem report as to the mode of infection in these cases. Hayen reports a case of epistaxis in which a chemist plugged the nose with tampons soaked in perchloride of iron. The patient died a few days later with symptoms of meningitis. At the post-mortem the whole length of each olfactory sulcus had a brown discoloration and the nerve substance reacted to Prussian blue. It was evident that the perchloride of iron had reached the brain along the nerve branches passing through the cribriform

plate. In ten cases of ethmoidal cell suppuration with intra-cranial complication cited by Dreyfuss, perforation or disease of the cribriform plate was found in three, in one perforation of the lamina papyracea, in one the infection spread by way of the orbit, and in one no statement was made as to the pathological condition present in the bone. In the remaining five there was no naked-eye evidence of disease of the lamina cribrosa. Four of the latter were acute cases of sinus suppuration, in which death supervened so rapidly that destruction of the bone was not possible; in them death resulted from basal meningitis, which was well marked over the ethmoid plate. Unfortunately no microscopical examination was made of the ethmoid bone.

Twelve cases of fatal intra-cranial complication secondary to sphenoidal sinus suppuration are quoted by the same author. In only one case, namely that published by Ortmann, was a microscopical examination made of the mucous membrane and osseous wall of the sphenoidal cavity. In the mucosa, periosteum, osseous tissue, and dura mater numerous diplococci and pus cells were observed. The intra-cranial affection in this case was an extra-dural abscess in the sella turcica with thrombosis of both cavernous sinuses secondary to periostitis and osteitis of the sphenoidal sinus. There was no evidence microscopically of lymphatic invasion. The existence of cavernous sinus thrombosis indicated an extension of the infection through the small venous channels penetrating the bony wall of the sphenoidal sinus and opening into the cavernous blood space.

In Gerber's classical monograph, *Die Komplikationen der Stirnhöhlenentzündungen*, published in 1909, 160 cases of intra-cranial complication secondary to frontal sinus inflammation have been collected and carefully analysed. Of twenty-eight cases of extra-dural abscess, one reported by Gyselynck and Mayer was regarded as probably due to infection by way of the lymphatic channels. The case was one of acute frontal sinus inflammation due to streptococcal infection. The sinus walls at the operation showed no defect. As the patient recovered, proof is wanting as to the exact manner of the infection. In fifty-one cases of purulent leptomeningitis and fifteen cases of thrombo-phlebitis none were ascribed to lymphatic infection. In only one of sixty-six cases of brain abscess was the infection regarded as propagated by the lymphatic vessels. The case which was published by Hoffmann was one of chronic bilateral frontal sinus suppuration complicated with abscesses of streptococcal origin in

both frontal lobes. A perforation of the posterior osseous wall was found in the right frontal sinus, but Hoffmann regarded the lymphatics as the path of infection to the left frontal lobe from the left frontal sinus. Unfortunately no microscopic examination was made.

It is obvious, therefore, that the conclusive proof of intracranial infection by pyogenic organisms from the nose by way of lymphatic vessels requires more direct evidence than has yet been obtained. In addition to the cases already mentioned, others are recorded, *e.g.* those of Huguenin, Ogston, and Warner, in which to the naked eye no bone lesion was apparent, Ortmann's case, however, demonstrates the fact that even in such instances microscopic examination proves that the infection will spread through the bony walls by continuity of inflammation; therefore one is not justified in assuming that, because there is no macroscopic change in the bone, the infection must in consequence have spread by lymphatics. In all fatal cases of this kind a more minute histo-pathological examination is very desirable.

(b) and (c) *Pneumococcal and Influenzal Meningitis*.—It will serve our purpose equally well and prevent needless repetition if pneumococcal and influenzal meningitis are considered together. Both Fränkel's pneumococcus and Pfeiffer's bacillus may be found together in the nasal secretion, and the latter has been found in a few cases of meningitis, sometimes alone and sometimes in association with pyogenic cocci. Pfühl¹² is of the opinion that in these cases the path of infection to the brain is directly through the roof of the nasal cavity. Although meningitis due to both of these organisms may result from a blood infection, there is evidence of direct meningeal infection from the nasal, post-nasal, and accessory nasal cavities. As proof of this statement it is not necessary to do more than cite a few illustrative cases. It is true that the same difficulty which was found in proving a lymphatic connection in pyogenic affections is again encountered here, and we are forced to assume rather than bring proof of the exact pathway of infection. Weichselbaum has drawn attention to the possibility of the inflammation spreading from the meninges to the nasal cavities. In the cases of primary acute meningo-encephalitis investigated by Weichselbaum¹³ from which the pneumococcus was cultivated, the same organism was found in the nasal accessory sinuses and middle ear cleft in four instances. The

examination of the relative degree of the inflammation existing in the meninges on the one hand and the accessory nasal cavities on the other forced him to conclude that the infection had spread from the nose and pharynx by way of the sinuses and middle ear cleft to the meninges. The same author¹⁴ has recorded a case of acute leptomeningitis and frontal lobe abscess due to the pneumococcus in a young man suffering from influenza, in whom the right maxillary and frontal sinuses were affected.

It is regrettable that a complete examination was not made in Zörkendörfer's¹⁵ case. The patient was a woman, *æt.* 30, who was brought to the hospital in an unconscious condition. Two days previously she had suffered from a rigor. Her temperature was elevated. She became comatose, and developed rigidity of the neck and paralysis of the right facial nerve. Two days after admission she died. Post-mortem examination revealed redness and detachment of the mucous membrane of the nasal and ethmoidal cavities, and the mucosa of the sphenoidal sinuses was covered with thick pus. The other organs showed no evidence of disease. There was a well-marked leptomeningitis both of the convexity and of the base of the brain. Fränkel's pneumococcus was found in the meninges and in the pus in the sphenoidal sinuses. Microscopical sections demonstrated the pia-arachnoid infiltrated with round cells. The meningeal vessels were filled with blood, the leucocytes being increased in number, in some places half of the lumen being filled with dense masses of the same. Zörkendörfer concluded from this examination that the pneumococcal immigration did not take place by way of the blood-vessels, because the large leucocyte masses within the blood-vessels were free from bacteria, whereas the meningeal exudate was infiltrated with cocci. He was therefore inclined to the view that the passage of the organisms into the cranial cavity had taken place either by the lymph channels or by the inflammation spreading by continuity of tissue through the walls of the sphenoidal sinus to the membranes. It is unfortunate that no histological examination of the bone was made.

Grober¹⁶ has recently discussed the path of infection in pneumococcal meningitis and considers that it may be by the lymphatic channels as well as by the blood-vessels. He regards the lymphatic tissue of the naso-pharynx and pharynx as a portal of infection in pneumococcal meningitis, the organisms

normally present in the nose and mouth finding ready access under pathological conditions. As regards the pathway from the portal of entrance to the meninges, he says further investigation has yet to be made. Two cases bearing upon direct infection from the upper air-passages are recorded in Grober's paper. In the first case, as the result of a fall upon the occiput, a fracture of the base of the skull passed through the root of the nose and the ethmoidal bone. The patient died without any evidence of pneumonia. He discusses the question as to whether the organisms gained entrance through the injury to the scalp or reached the meninges from the nose, and he decided upon the latter route. The second case was that of a child, *æt.* 8, who developed all the signs of meningitis; spinal puncture revealed the presence of pneumococci in the cerebro-spinal fluid. The posterior wall of the pharynx, uvula and tonsils was markedly inflamed from the very outset of the symptoms. All the other organs were healthy, and there was no clinical evidence of pneumonia. The child recovered under treatment with Römer's serum.

Meningitis due to Pfeiffer's influenza bacillus, although not common, is now well recognised. Pfühl¹² was the first to demonstrate the presence of the bacillus in the meningeal exudate. Dubois has collected eleven cases of meningitis in which the bacillus was present, and many other cases are recorded. The question of the portal of entry of the bacillus *influenzæ* into the central nervous system has been much discussed. We have already referred to the presence of the organism in the nasal and accessory cavities, and the fact that the common type of influenza is the respiratory one, often characterised by an acute rhinitis, would suggest the nose and naso-pharynx as a probable portal of entry. E. Fränkel is an advocate of the hypothesis that the bacilli are conveyed by the lymphatics of the nasal mucosa through the cribriform plate directly into the cranium. While the theory is plausible post-mortem evidence of this pathway of infection is not satisfactory. Ghon¹⁷ has reported the case of a man dying of influenzal meningitis. The mucous membrane of the naso-pharynx was red and swollen and covered with a mucopurulent discharge; in the right frontal sinus there was a quantity of yellow pus, while the mucous membrane of the right antrum was swollen and the cavity contained exudation. There was a leptomeningitis of the right cerebral hemisphere.

The mucosa of the larynx and trachea was also inflamed and a lobular pneumonia existed. The meningeal exudate, as well as that in the frontal and maxillary sinuses and in the naso-pharynx, contained a similar organism, colonies of which were identical in appearance to that of the bacillus influenzae.

Penéker, Mya, Cagnetto, Cohen, Hecht, Langer, James Ritchie, and others have reported cases of meningitis associated with an influenza-like bacillus, occurring at a time when influenza did not exist in an epidemic form. The subject is thoroughly discussed by Ritchie¹⁸ and is referred to here on account of the possibility of the meningeal infection being secondary to a nasal and naso-pharyngeal inflammation. The cases are apparently sporadic, and young children are affected. The condition is extremely fatal. Although in some cases the meningeal affection has been part of a general pyæmic process, a further point of note is the frequent association of the meningitis with middle ear suppuration or with suppuration of the frontal or maxillary sinuses. While it must be borne in mind, in the light of certain of the cases showing evidence of a general pyæmia, that the pus in these cavities and in the meninges may arise from some common source of infection elsewhere in the body, a provisional opinion may be expressed that in many of them, perhaps in the majority, the meningitis results from the spread of an infective condition from the naso-pharynx.

(d) and (e) *Epidemic Cerebro-Spinal Meningitis and Acute Poliomyelitis*.—These two diseases of the central nervous system possess certain features in common which justify us in briefly studying them together. They occur both in epidemic form and as sporadic cases, and they must be regarded in the light of acute infectious diseases. They attack by preference infants and young children. What is of chief importance, however, in connection with our subject is the fact that the virus in both conditions is found in the naso-pharynx, and appears to have a predilection for invasion of the naso-pharyngeal mucous membrane, and from there to pass, presumably by the lymphatic system, to the central nerve apparatus. It should be pointed out that Flexner has been able to demonstrate in monkeys the passage of the meningococcus within the leucocytes from the meninges into the naso-pharynx, so that in cerebro-spinal meningitis the naso-pharyngeal mucous membrane may serve both as an exit and as an entrance for the organism. In man it is naturally difficult to establish the former.

Although no organism has yet been identified in the production of acute poliomyelitis, Flexner has demonstrated experimentally that the disease can be conveyed to monkeys by inoculating an emulsion of the virus from fatal cases in man; further, that the disease can be transmitted through a series of monkeys. Up to the present time investigators have failed to demonstrate the virus as an entity visible through the microscope.

Cerebro-Spinal Meningitis.—We have already referred to the presence of the meningococcus in the naso-pharynx in West's series of investigations in cases of chronic naso-pharyngeal catarrh, and many observations might be quoted as to its occurrence in the naso-pharynx, not only in those who have been victims of the disease, but also in those who have been in contact with patients, and who must be regarded as carriers. Westenhöffer's researches and those of Lingelsheim have made it more probable that the nasal cavities proper and the accessory sinuses do not serve as the portal of infection in the same way as does the naso-pharynx. The former¹⁹ in thirty post-mortem examinations upon fatal cases of the disease, found the ethmoidal cell labyrinths almost always free from inflammatory disease. Bacteriological investigation confirms this, because in the secretion from the nasal vestibule and anterior part of the cavities the meningococcus was seldom isolated, whereas it was very frequently found in the secretion from the posterior part of the nasal cavities and the naso-pharynx. Lingelsheim's observations are of a similar nature.

Edmund Meyer²⁰ examined a number of children affected with the disease during the epidemic in Upper Silesia in 1905. The naso-pharynx was examined during the early days of the affection, and in spite of the difficulties attending posterior rhinoscopic examination well-marked inflammatory changes were observed in the naso-pharynx. Some of his observations were confirmed by post-mortem examination. In the other organs examined after death no changes or only very unimportant ones were recognised. If the naso-pharynx could be observed before the onset of the meningeal symptoms, more valuable proof of this portal of infection would be obtained. In the only case in which Meyer observed the outbreak of the disease, naso-pharyngeal symptoms preceded the others. Busse²¹ has also given attention to this point and has confirmed the observations already made, and has satisfied himself that in the rapidly fatal cases redness and swelling of the mucosa with excess of secretion in the naso-pharynx existed, while in the cases following a slower course the changes in the mucous membrane were more advanced.

If these facts be accepted, the question naturally arises as to the pathway of the organisms to the meninges. The evidence is somewhat conflicting as to the part played by the sphenoidal sinus. This cavity does not commence to develop until the third year of life, therefore in many young children, who form so large a proportion of these cases, this route cannot be considered. Meyer examined clinically one hundred cases of the disease and was of the opinion that the sphenoidal sinuses were not affected. Westenhöffer made a routine examination of the accessory sinuses post-mortem, and in the acute stage frequently found swelling of the mucous membrane with mucoid exudation and sometimes pus in the cavity. Meyer made serial sections of the naso-pharyngeal tonsil, but was unable to detect the organism in the deeper parts. He only observed it upon the surface. The frequency of inflammation in the middle ear cleft in cases of cerebro-spinal meningitis raises the question as to whether it may not take part in carrying the infection from the naso-pharynx to the meninges. Hirsch has pointed out that in the early stages of the disease patients may complain of ear symptoms. The question arises, therefore, as to whether the labyrinthine disease so frequently met with in this affection may not result from infection spreading from the middle ear rather than as a labyrinthitis secondary to the meningeal inflammation, as has so long been held to be the case. In this as in the other forms of meningitis already discussed the part played by lymphatic vessels in the propagation of infection is still open to further investigation.

Acute Poliomyelitis.—Flexner²² believes that the nasal mucous membrane serves not only as the portal of infection, but also as the path of elimination of the virus, and he further considers that all the theoretical conditions required to establish the nasomeningeal route as the direct one for infection have been supplied by experiment. In the report of the Collective Investigation Committee of the New York Epidemic of 1907 Wickham has called attention to the lymphatics as the route of infection. Flexner and Lewis have shown that the virus will travel up the sheath of the sciatic nerve. The question naturally arises, therefore, as to whether the infection may spread from the upper respiratory passages to the meningeal spaces. Harbitz and Schoel in the one case which they were able to examine microscopically could not find any evidence of infection passing along the olfactory nerves, and the nasal and accessory cavities were normal. Levaditi²³ was unable to inoculate the nasal mucous

membrane with the virus with any positive result. The more recent observations of Sohier Bryant²⁴ tend to show that nasopharyngeal catarrh is very prevalent in communities in which poliomyelitis existed, while the experiments of Osgood and Lercas²⁵ demonstrated that it was possible to transmit from monkey to monkey a typical poliomyelitis from the filtrate of the nasopharyngeal mucosa of two monkeys dying without any other obvious infection six weeks and five and a half months respectively after the acute stage of the disease. In all probability further light will be thrown upon the transmission of this acute infectious disease in the immediate future.

(f) *Tuberculous Meningitis*.—Considerable discussion has from time to time arisen as to the part played by the nasal and post-nasal cavities as pathways of infection in tuberculous meningitis. The existence of tubercle bacilli in the healthy nose and their presence in adenoid vegetations, the occurrence of primary nasal tuberculosis as a more common affection than was at one time realised, and the close proximity of the cavities to each other would naturally lead us to assume that infection of the meninges by way of the nasal passages might not infrequently occur. Weigert, indeed, believed that this was the usual mode of infection.

Experimental work upon the production of meningitis by inoculating the nasal mucosa with tubercle bacilli has been carried out by Magunna and Knowles Renshaw and others. The former investigator²⁶ used an emulsion of a culture of bacilli, in some cases injecting the mucosa with a few drops by means of a Pravaz syringe as far back in the nasal cavity as possible, in other cases merely laying a few drops of the emulsion upon the healthy surface of the olfactory mucous membrane. Of the twenty guinea-pigs thus inoculated six died of meningitis. Of the six cases in which inflammatory changes were found in the cerebral membranes three had been inoculated beneath the mucous membrane, while in the remaining three the surface had merely been smeared with the emulsion. The animals lived from sixteen days to one month after the experiment. In all the animals the nasal mucous membrane was congested, and in four granulations were also present. In the first experiment these granulations are described as miliary tubercles; when examined microscopically no bacilli were found in them, and they were not used for further inoculation experiments. In all the cases the meninges were congested, while in three granulations were also found. The changes were most

marked at the anterior part of the brain, and in three of them special reference is made to the intensity of the inflammation in the region of the cribriform plate. All the animals lost weight.

Knowles Renshaw²⁷ infected the nasal mucous membrane of guinea-pigs with tubercular sputum, the part of the nasal cavity selected being the superior fossa. In three it was introduced in the fluid state through a small silver cannula, while in the fourth a piece of dried sputum was introduced by means of a piston through the cannula. In order to avoid any bruising of the mucous membrane, chloroform was administered in each case. Three animals were killed on the twenty-seventh, fifty-seventh, and fifty-fourth days respectively, while the fourth animal died on the ninety-eighth day. In none of these experiments was meningitis produced. Although Magunna's observations supply experimental evidence of the direct spread of inflammation from the nasal cavity to the meninges, no proof is forthcoming as to the path of infection, as apparently the tissues were not subjected to any histological examination. For the same reason it is not definitely proved in these experiments that the resulting meningeal infection was of a tuberculous nature. The anatomical researches of André upon the naso-meningeal communications show that the lymphatic network occupies the olfactory portion of the nasal cavity, and is distributed upon the upper fourth or third of the nasal septum and external wall of the cavity. The extent of this area will doubtless vary, therefore, in different animals. At the same time it might exert an important influence upon the seat of inoculation in experimental work. Renshaw placed his tuberculous material in the upper part of the cavity without injuring the mucous membrane, and we may presume from this description that the olfactory region was reached. No meningitis, however, developed. Magunna, in three experiments in which the mucosa was injured, passed the needle of his syringe to the posterior part of the nasal cavity; also in three experiments in which no injury was inflicted the olfactory mucosa was smeared. In all his experiments, however, pathological changes in the meninges of the anterior cerebral fossa were observed. In two experiments carried out for me by Dr. J. S. Fraser, in which the anterior part of the nasal fossa was inoculated, no meningeal inflammation was set up.

Denme's case²⁸ has often been quoted as furnishing evidence of tuberculous meningitis secondary to a focus in the nasal cavity. The patient was a child, *æt.* 8 months, without any antecedent

history of tubercle or syphilis. When 4 months old the child had been put out to nurse in a family, the father of which suffered from acute pulmonary tuberculosis. When 6 months of age a discharge from the nose was observed and examination revealed the presence of small ulcerated granulations. In the secretion from the nose a large number of tubercle bacilli were found. Without any apparent cause the child developed symptoms of acute meningitis, and died four days afterwards. At the autopsy tuberculous meningitis at the base of the brain was found, many miliary tubercles being scattered along the vessels, especially about the anterior and inferior cerebral veins. No tubercle was observed in the substance of the brain or the cerebellum, no caseous foci existed in the lungs, bronchial glands or other organs, which were quite healthy. The mesenteric and axillary glands were slightly swollen. No examination of the ethmoidal region was made, but the nasal mucous membrane was examined microscopically by Langhans, who reported upon the presence of tubercle bacilli associated with giant cell systems. Huey²⁹ has reported a case of extensive tuberculous disease of the left nasal cavity in a patient who submitted to an operation for the removal of some of the tissue. Three weeks later headache, vertigo, fever with delirium, strabismus and ptosis developed, which was followed in eight days by coma and death. No post-mortem was obtained. Clinically, no lesion could be demonstrated in the chest. Huey concluded that the meninges had become directly infected from the nasal cavity.

Summary.—It is evident from the foregoing account that the part which has been assigned to lymphatic vessels in carrying infection from the upper air-passages to the cerebro-spinal cavities is largely speculative, and that definite pathological proof of the same is still wanting. It appears from the data collected that some writers have given to lymphatic channels between the nasal and accessory nasal cavities on the one hand, and the central nervous system on the other, a position which is hardly justified by anatomical facts as at present known. Even granting that future investigation may demonstrate a well-developed network of inter-communication, the lymph-flow through it will take a direction from the brain towards the nasal cavities and cervical lymphatic glands. Consequently the danger of meningeal infection by such an avenue from organisms in the nasal cavities will be diminished. The experiments of Flexner already referred to, that the meningococcus will pass from the meninges into the naso-pharynx and

that the naso-pharyngeal mucous membrane thus serves as a gate of exit for the organism, furnish experimental evidence upon this point. In the great majority of cases of chronic nasal suppuration in which an intra-cranial complication has developed, evidence has been found demonstrating the spread of the infection through disease of the contiguous bony wall. In cases of meningeal infection, however, in which no chronic nasal disease has existed, and in which destruction of the bony walls has therefore not been possible, some other path of infection must be looked for. This may be, and in some cases has been, definitely shown to be by venous channels. It will require further investigation, first along anatomical lines, and secondly by careful microscopical examination, both in experimentally induced meningitis and in fatal cases in which nasal and accessory sinus disease has furnished the primary focus of infection, to prove that such infection may take place by lymphatic channels.

B. TUBERCULOUS INFECTION OF THE CERVICAL LYMPHATIC GLANDS AND LUNGS FROM THE NASAL AND NASO-PHARYNGEAL MUCOUS MEMBRANE.

It is intended in this part of the subject to illustrate the relation of the lymphatic system of the nasal and post-nasal cavities to other parts of the body by means of the tubercle bacillus. We are thus at once brought into touch with the question of the main avenues of infection of tuberculosis, namely, by inhalation, ingestion, and lymphatic invasion. The problem which interests us is not so much one of aerogenic or inhalation as opposed to ingestion or deglutition tuberculosis, but rather of aerogenic versus lymphatic invasion. In other words, to what extent are the lungs primarily infected by inhalation of material containing tuberculous virus, or in what proportion of cases are they infected through the cervical lymphatic system from inoculation of the nasal and naso-pharyngeal mucous membrane. The lines along which research has been conducted have been anatomical, experimental, and clinical, and it is our intention to discuss the subject in the same way.

Anatomical Considerations.—The regional lymphatics of the nose and naso-pharynx so ably worked out in recent years by Most³⁹ may be briefly summarised here in order to make more clear the clinical points which follow. With the exception of a small area of mucous membrane in the anterior part of the nasal cavity from which the lymph channels pass forwards on to the face, the

main lymphatic drainage passes backwards through the choanae. The lymphatic vessels, along with those from the naso-pharynx and from the palatal arch and faucial tonsil, terminate in the superior deep cervical glands, some of which lie along the internal jugular vein, while others are placed more laterally beneath the sterno-mastoid muscle and upon the anterior scaleni muscles. The lymph flow from both these groups passes into the inferior deep cervical glands, which, like the superior, lie in two groups, one placed more superiorly and externally in the supraclavicular triangle, the other more mesially placed in relation to the internal jugular vein and common carotid artery extending behind the inner end of the clavicle. The efferent vessels from the inferior deep cervical glands form a common lymphatic jugular trunk, which opens on the right side of the neck into the veins at the junction of the internal jugular and subclavian veins, and on the left side into the terminal bend of the thoracic duct.

It is necessary for our purpose to note further the lymph flow in the mediastinal glands. The tracheal and bronchial glands receive their afferent vessels from the mucous membrane of the trachea, the bronchial tubes, and pulmonary alveoli. The efferent vessels from the tracheo-bronchial glands, along with the majority of the parietal and the whole of the visceral lymphatics of the thorax, assist in forming a broncho-mediastinal trunk, which terminates like the jugular trunk in the large veins at the root of the neck upon the right side and in the thoracic duct on the left side.

It is evident, therefore, anatomically, that the lymphatic drainage of the nose and naso-pharynx passes through the deep cervical glands into the venous circulation at the root of the neck, and has no direct communication by efferent lymph vessels with the tracheo-bronchial glands. Similarly, the lymph from the tracheo-bronchial glands passes into the venous circulation, and has no direct communication with the inferior deep cervical glands. The supraclavicular glands, however, receive certain afferent vessels from the arm, the integuments of the pectoral region, and also from the mamma.

Most has drawn attention to the difficulty in injecting from the pharynx the inferior deep cervical glands lying in the supraclavicular triangle. Lasagna³¹ has recently confirmed these observations. He injected with coloured material the superior deep cervical lymphatics, and in forty-one out of forty-two cadavera the material passed into the large veins quite independently both of the group

of glands in the supraclavicular triangle and of the tracheo-bronchial glands. While anatomical investigation has apparently failed to establish a direct communication between the mediastinal glands and the deep cervical glands in the supraclavicular triangle, there would appear to be clinical evidence to the contrary. This would appear to be a suitable place to refer to clinical observations in this connection. When the supraclavicular glands are found enlarged without any evidence of the enlargement of the superior deep glands in the cervical chain, the attention of the clinician is naturally directed to the thorax in seeking a cause for the enlargement of the former. The following two cases which have recently come under my observation bear upon this point:—A. S., *et.* 50, had suffered from hoarseness for three months; he was becoming thinner, and had lost one and a half stone in six months. He first noticed enlarged glands above his right clavicle three months before he came under observation. He had had no respiratory trouble and no difficulty in swallowing. The left vocal cord was fixed in the cadaveric position. The glands above the right clavicle were hard and gave the impression of being malignant. The superior deep cervical glands were not enlarged. Examination of the chest revealed an area of dulness to the left of the sternum; an X-ray picture showed a distinct abnormal mediastinal shadow. A diagnosis of malignant disease of the mediastinal glands was made, with involvement of the left recurrent laryngeal nerve.

The second case was that of a woman who had had her right breast removed for malignant disease. She had suffered from hoarseness for two and a half months before she came under observation, and more recently she had noticed enlargement of the glands above her right clavicle. Her left vocal cord was fixed in the cadaveric position. In this case we had no post-mortem information regarding the condition of the intra-thoracic organs. While it might be argued that the enlargement of the right supraclavicular glands was due to a secondary growth spreading to them by way of superficial lymphatic vessels from the pectoral region, the associated paralysis of the left vocal cord indicated involvement of the left recurrent laryngeal nerve, presumably from enlarged glands within the thorax. Both cases, therefore, appear to us to furnish clinical evidence of communicating lymphatic vessels between mediastinal and cervical glands. It is possible, therefore, that the supraclavicular glands may occupy an intermediate position, receiving afferent vessels both from above and from below.

While the above facts represent the anatomical arrangement of the lymphatic drainage of the neck and the relation of the mediastinal and cervical lymph systems, we must now consider the evidence furnished by experimental and clinical data. Three propositions have been put forward as to the manner in which tubercle bacilli may pass from the cervical lymphatics to the lungs and mediastinal glands. We have, in the first place, that which is based upon the anatomical facts above described, namely, by way of the large veins to the right side of the heart and thence by the pulmonary artery to the lungs and tracheo-bronchial glands. Secondly, the thesis held by Klebs, Grober, Philip, Bacon-Wood, and others that the lowest of the deep cervical glands infect the apex of the lung by direct extension through the tissues. Thirdly, the view held by Aufrecht³² and others that an anatomical connection exists between the cervical and mediastinal glands, so that infection will pass direct from the former to the latter and thence to the lungs through adhesion of the glands to the pulmonary artery and the entrance of the bacilli into the blood-stream through its wall.

Experimental Considerations.—Sufficient experimental proof has been brought forward by a number of observers to prove that tubercle bacilli inoculated upon the mucous membrane of the upper air-passages will infect the cervical glands; it is unnecessary to dwell further on this well-recognised fact. Experimental proof, however, as to the mode of extension of the infection from these glands to the bronchial glands or to the lungs is more difficult to obtain, because when the nasal or naso-pharyngeal mucous membrane is inoculated with tuberculous virus the possibility of pulmonary infection by inhalation cannot be lost sight of. Consequently the difficulty in deciding as to the part played by the cervical glands in propagating the infection to the lungs is obvious. The assertion that the real pathway can be ascertained by noting the older and the more recent tuberculous changes may be true in some cases, but it cannot be always accepted as providing reliable data from which the correct deduction may be drawn. Thus if the cervical glands show evidence of advanced tubercular disease, while the changes in the lung and bronchial glands are of a more recent date, it would be natural to assume that the infection had spread to the last-named structures from the pharyngeal mucous membrane by way of the cervical glands. We cannot,

however, exclude the possibility of the pulmonary disease arising by inhalation as an infection quite independent of and possibly more recently than that of the cervical glands. That tuberculous infection may take place by a twofold portal of entrance is illustrated by the inhalation experiments of Louis Cobbett.³³ By spraying an emulsion of tubercle bacilli in front of guinea-pigs he found that when the animals were killed after a few minutes or hours the lungs were found to be infected, while the cervical glands showed no evidence of tubercle. On the other hand, in seventeen animals similarly dealt with, which were allowed to live from five to thirty-six days, sixteen showed pulmonary and bronchial gland tubercle, the gland infection being secondary to that of the lungs. In thirteen of the animals the deep cervical glands were also affected, their infection taking place early in the course of the experiment and concurrently with the lung infection, but the disease had progressed more slowly in them, the bacilli being few in number.

Other difficulties which present themselves when we attempt to follow the path of infection taken by the tubercle bacillus are found in the fact that the bacilli may leave no sign to indicate their point of entry, and that they may be present in the glands without producing any histological evidence of their existence there. Thus Bartel and Spieler³⁴ have demonstrated, by inoculating animals with the lymphoid tissue from the pharynx, that in 11 per cent. of cases tuberculosis could be produced, and yet in none of the specimens of tonsil used was there any microscopical evidence of tuberculous tissue. Similarly, as the result of inoculating cervical gland tissue into animals, tuberculosis was produced in 58 per cent. of the experiments, while microscopical evidence of tubercle was only found in 45 per cent. of the glands; the tubercle bacilli were scanty or could not be found. Numerous other investigators have carried out similar experiments. Further, it must be remembered that once the lungs have become the seat of tuberculous disease, the cervical glands may be secondarily infected by the tubercle-laden sputum most commonly passing through the faucial tonsils, but possibly also in some cases through the naso-pharyngeal lymphoid tissue. Again, naso-pharyngeal secretions containing bacilli may be swallowed and the organisms taken up by the mesenteric lymph glands and thence conveyed to other groups of glands. For these reasons, therefore, it may be difficult to follow the exact pathway of infection.

The experiments of Knowles Renshaw²⁷ throw some light upon the path of infection from the cervical glands to the thorax. He inoculated the surface of the nasal mucous membrane of seven guinea-pigs with sputum containing tubercle bacilli. In one group of animals, four in number, the entrance and the anterior and lower part of the nasal cavity were inoculated; in the second group of three animals the application was made to the superior and more posterior part of the cavity. In the former the animals were killed from twenty-eight to fifty-six days after inoculation. In all of them slight inflammatory changes were observed in the nasal mucosa. The respiratory passages were normal; the lungs and peribronchial glands were unaffected; the abdominal organs were healthy. Evidence of tuberculous disease was only found in the cervical glands.

In the second group, in which the more posterior part of the nasal cavity was inoculated, the three animals lived for fifty-four, fifty-seven, and ninety-eight days respectively. Caseous material, ulceration of the mucous membrane and tubercle bacilli were found in the nasal chamber in all of them. The pharynx, larynx, and trachea were normal. The lungs showed extensive tuberculous disease, and the bronchial glands were also tuberculous. The cervical glands were similarly affected. The liver and spleen were also tuberculous.

It is obvious from these experiments that a local nasal tuberculosis may be produced by merely painting the mucous membrane with a suitable virus and that the efferent lymphatic vessels will carry the infection to the cervical glands. They further demonstrate the fact that the bronchial glands only became infected in those cases in which the lungs were also involved. These experimental data support the anatomical facts already detailed. The question as to the mode of infection of the lungs requires consideration. Two avenues of infection are possible, either an inhalation tuberculosis taking place *pari passu* with the cervical gland infection or infection through the cervical lymphatics into the large veins and right side of the heart, thence to the lungs. In favour of the latter route is the character of the lung infection. In two the lungs were studded with tuberculous deposit, in the third there was "extensive disease of the lungs," or to quote Renshaw's own words more fully, "the infection was never confined to one or two foci, but consisted of numerous tubercles scattered fairly evenly through all the lobes of the lungs." This description suggests the miliary nature of the pulmonary tubercle

such as would arise from infection carried through the pulmonary artery. Again, the presence of tubercle in the liver and spleen furnishes additional evidence of the bacilli having passed through the blood circulatory system. Knowles Renshaw considered that his experiments proved that the various organs had been infected through the lymphatic circulation in the following order:—superficial and deep cervical glands, peribronchial and retrohepatic glands, lungs, liver and spleen. The experiments seem to us, however, to furnish proof of infection by the first of the three avenues which we have described, and consequently support the more direct anatomical route.

Vallée³⁵ introduced several milligrams of living tubercle into the naso-pharynx in twelve cattle. In no case was pulmonary tuberculosis induced. In four of the animals, however, tubercle was demonstrated in the retropharyngeal glands, in the cervical and in the tracheal glands. These experiments furnish proof of the direct passage of infection from the naso-pharynx through the lymph paths to the cervical glands, but in the light of our anatomical knowledge they cannot be regarded as demonstrating the further passage of the organisms from the cervical to the tracheal glands. Even though the lungs remained unaffected, some of the bacilli may have found their way by inhalation to the trachea, where an infection of the mucous membrane would give rise to disease of the tracheal glands through their afferent lymphatics.

Clinical and Pathological Considerations.—The tubercle bacillus has been identified by various observers in the healthy nasal cavities. Strauss³⁶ was able to demonstrate its presence in persons connected with hospital life by inoculating and infecting guinea-pigs with the nasal mucus. Moeller³⁷ found the bacilli on three occasions in his own nose and also in the nasal secretion of the attendants and ward maids of a sanatorium. Noble Jones³⁸ was able to produce tuberculous disease in three animals out of thirty-one after inoculating them with the nasal secretion from healthy individuals. Von Besser examined eighty-one healthy persons without finding any tubercle bacilli in their nasal secretion. That tubercle bacilli may lodge in the nasal cavities and produce a localised tuberculous affection of the mucous membrane is shown by the number of cases of nasal tuberculosis met with. During the last four years fifty-six cases of this condition have come under observation in the Ear and Throat Department of the Edinburgh Royal Infirmary.

It is rare to find the tubercle bacillus in inflammatory conditions of the accessory sinuses. It was only occasionally isolated in our own observations.¹ Keekwick, Gaudier, and Coakley have each recorded a case of primary tuberculous infection of the maxillary sinus.

In the naso-pharynx, however, mainly in connection with the naso-pharyngeal tonsil, many investigators have demonstrated the presence of tubercle bacilli or changes in the lymphoid tissue dependent upon the bacillus. This evidence has been obtained partly by inoculation experiments and partly by histological examination of the tissue removed by operation. I have only tabulated the results obtained in individuals in whom there was no reason to believe that tubercle existed elsewhere in the body, consequently all are cases of primary infection of the naso-pharyngeal tonsil. The percentage of cases in which evidence of tubercle was found varied from 2, 3, 4 and 5 per cent. to 12, 14, 16 and 20 per cent., giving an average of 6 per cent. of adenoids harbouring tubercle.

Author.	Tubercle.	Cases Examined.	Per Cent.
Pilliet	3	40	7
Lermoyez	1	75	1
Dieulafoy	7	35	20
Gottstein	4	33	12
Pluder and Fischer	5	32	14
Pill	3	100	3
Lewin	10	200	5
McBride and Logan Turner	3	100	3
Moure	1	40	2
Broca	0	100	...
Brindel	8	64	12
Luzzati	0	50	...
Scheibner	0	14	...
Wex	7	210	3
Hynitsch	7	180	3
Baup	1	48	2
Wright	0	51	...
Blumer	4	85	4
Lartigan and Nicoll	12	75	16
MacFayden and MacConkey	0	44	...
Ivens	1	35	2

Dieulafoy, whose percentage of twenty was obtained by inoculation experiments, has been criticised on the ground that the tubercle bacilli might have been in the secretion upon the surface of the tissue injected, while the adenoid mass may have been

destitute of any evidence of tubercle. This possibility, however, does not affect our thesis, as we are concerned only with the presence of tubercle in the naso-pharyngeal space. Lartigan and Nicoll's results, twelve positive findings in seventy-five specimens, or 16 per cent., were also obtained by inoculation. In eight of these tubercle bacilli and histological evidence of tubercle were also found in the hardened tissues, while the remaining four contained tubercle bacilli without any histological changes. The negative results of MacFadyen and MacConkey were also obtained by inoculation.

Having thus demonstrated the presence of tubercle in the lymphatic tissue of the naso-pharynx, two illustrations of its extension to the neighbouring lymphatic glands may be cited. These cases were reported some years ago.³⁹ A boy, *æt.* 14, with a good family history, healthy looking and well nourished, and with no pulmonary disease presented a mass of enlarged lymphatic glands involving the left superior deep cervical chain; the glands were matted together and formed a swelling about the size of a hen's egg. A large mass of adenoid hypertrophy occupied the naso-pharynx. The adenoids and the hypertrophied cervical glands were removed. Evidence of tubercle was found in both situations. In the lymphatic tissue of the naso-pharynx tubercular giant cells, endothelioid cells and areas of degeneration were found but no tubercle bacilli could be detected. The largest of the cervical glands showed extensive caseation, while the smaller ones presented numerous small yellow caseous points. Microscopically numerous giant cell systems were observed in the glands. Nine months after the operation the boy was in the best of health and there was no trace of any glandular enlargement in the neck. The second case, a very similar one, was that of a girl, *æt.* 11, with well-marked adenoids and several enlarged glands in the deep cervical chain on both sides of the neck. A history of suppuration in connection with one of the glands on the left side was obtained and a scar bore evidence of the same. In the lymphoid tissue from the naso-pharynx histological appearances similar to those described in the first case were observed.

While these two cases illustrate tuberculous infection of the superior deep cervical glands, the following case is quoted in order to show that the infection may extend down the glandular chain and involve the supraclavicular glands. In this case, a young woman, *æt.* 20, the primary infection took place through the

faucial tonsil, which was an enlarged submerged gland, the nose and naso-pharynx presenting a normal healthy appearance. On the left side of the neck three slightly enlarged glands could be palpated in the superior deep chain. Along the posterior edge of the sterno-mastoid muscle a chain of enlarged glands was visible, one gland in the middle of the chain being of some size. From the supraclavicular region a mass of caseous glands had been recently removed by the surgeon, who contemplated removal of those situated higher up after the tonsil had been enucleated. No evidence of pulmonary disease could be detected. Microscopical examination of the left tonsil furnished histological evidence of tuberculous infection in the form of a few scattered giant cell areas.

Up to this point, therefore, no difficulty has been met with either experimentally or clinically in establishing the presence of tubercle bacilli in the nasal cavities and a direct continuity of infection from the mucous membrane through the cervical chain of glands. The difficulty in establishing the further route of infection experimentally on account of the possibility of inhalation or even ingestion of the bacilli has already been pointed out. Clinical evidence as to the mode of extension from the neck to the lungs and mediastinal glands presents greater difficulties, and even post-mortem findings are not conclusive.

In connection with the lymph gland pathway in the pathogenesis of pulmonary tubercle, Beitzke⁴⁰ has made some interesting observations, based on post-mortem examinations. He first points out that in children a descending tuberculosis of the cervical lymphatic glands is not uncommon. In thirty-five cases of pulmonary and bronchial gland tubercle the cervical glands were found tuberculous in twenty-two and free from tubercle in thirteen. In seventeen out of twenty-four cases of descending cervical gland tubercle there was at the same time pulmonary and bronchial gland tuberculosis, the disease in the latter organs being much further advanced than in the cervical glands. In only four cases in the series it was possible that the lung affection was secondary to the cervical glandular disease. Beitzke, as a result of his post-mortem researches, came to the following conclusions:—As the pulmonary and bronchial gland affection is usually of longer standing and has made more progress than that in the cervical glands, the former have been infected by inhalation of the virus, while the latter have become infected either secondarily by inoculation with tuberculous sputum through the tonsils or

independent of the lung disease but co-existent with it and from the same source. Further, that in the absence of any direct lymphatic connection between the cervical and bronchial glands, tuberculous infection of the lungs by way of the cervical glands can only take place through the large veins and the right side of the heart.

Albrecht, from a study of one thousand and sixty tuberculous children, has formulated the view that the primary site of infection is most often in the lung from inhalation. If there is also tuberculosis of the cervical lymphatic glands, it is secondary to the pulmonary affection, and it is either of an ascending nature, from the peribronchial glands upwards, or descending, from secondary infection of the pharynx through the sputum.

In looking at this subject, from its clinical aspect, we are further led to study the second proposition, namely, the infection of the apex of the lung by direct extension from the lowest of the deep cervical glands. Grober has expressed the opinion that when the supraclavicular glands have become affected there is an extension of the disease to the thoracic parietal lymphatic vessels. This is followed by an inflammatory exudation, with consequent involvement of the visceral pleura and apex of the lung. George B. Woods⁴¹ has expressed the opinion that when the supraclavicular glands soften and a periadenitis takes place the neighbouring pleural apex becomes infected by continuity of tissue. A similar view is held by Philip.⁴² He suggests that an analogous condition is found in the passage of infective material from the liver into the lung. In connection with this method of pulmonary infection James Ritchie⁴² has drawn attention to the possibility of the tubercle bacilli being drawn into the lung by a process of suction. If the respiratory pump fills the heart at every inspiration in consequence of the relief which is thereby given to the elasticity of the lung, why should there not be a similar suction process taking place from the lymphatics all round the lung? He is of opinion that the small tubercles frequently seen on the thoracic surface of the diaphragm in cases of tubercular peritonitis have resulted from the suction of the bacilli through the diaphragm. Consequently, he argues that a similar force may possibly play the same part in connection with apical infection from the deep cervical glands.

The thesis of Grober and Philip has been opposed by Most.⁴³ If adhesions form between the deep cervical glands and the apex of the pleura, it is natural to expect evidence of such an infiltrating

process at post-mortem examinations upon patients dying with pulmonary tuberculosis. Most has been unable to find evidence of the same at autopsies. In addition to this negative finding, Most draws attention to the fact that it is not common to find the cervical lymphatic glands enlarged in pulmonary tubercle. In a large number of post-mortem examinations carried out in Breslau he was unable to find evidence of their enlargement, and Abrikisoff, who carried out a microscopical investigation of the glands, confirmed the views of Most as to the rarity of antecedent cervical gland tubercle. Our own observations on this point are entirely clinical, and are based upon the examination of a large number of cases of laryngeal tuberculosis secondary to pulmonary disease. In these cases of phthisis pulmonalis we have frequently commented upon the absence of cervical gland enlargement.

Reference has already been made to the occurrence of tuberculous disease of the nasal mucous membrane, and we have had an opportunity of observing it in fifty-six cases. The majority of these cases were classified as lupus, in which the destructive process is slow, and in which tubercle bacilli are found with difficulty. The disease which affects mainly the anterior part of the nasal cavity was often associated with a similar condition of the mucous membrane of the soft palate, fauces, and posterior pharyngeal wall, and in some cases with a similar condition in the larynx, especially of the upper aperture. Our object in referring to it at this point is for the purpose of drawing attention to the fact that the disease may exist for years in these situations without any general systemic infection taking place. Of the fifty-six cases investigated, we know only of two in which pulmonary tuberculosis developed. The ages of the patients varied from 7 to 56 years, and in many of them the disease had existed for a great number of years, varying from one to twenty years. We have been struck further in these cases with the absence of any marked enlargement of the cervical lymphatic glands, and with the general good health enjoyed by these patients. Thus in a patient 29 years of age the nose had been affected for twenty years, yet glandular enlargement was not observed. Although the disease affected the anterior part of the nasal septum and the vestibule, and consequently lay anteriorly to the main lymphatic drainage of the nasal mucous membrane, it must be borne in mind that the lymphatics from the anterior part of the nasal mucosa pass eventually into the deep cervical chain of glands by way of the

lymphatic vessels of the face and the submaxillary glands. While many of these patients came under treatment, local recurrence of the disease occurred from time to time, and fresh areas of mucous membrane became affected. Nevertheless the inferior deep cervical glands did not become enlarged, nor did pulmonary tuberculosis manifest itself.

We have still to refer to the third proposition, namely, that the cervical glands directly infect the mediastinal glands, and that the bacilli then pass from the latter to the lungs by entering the blood-stream in the pulmonary artery after adhesion of the glands to the vessel wall. As already shown, anatomical injections have failed to demonstrate any direct communication between the cervical and the bronchial glands. Aufrecht's work in connection with this subject cannot be lightly passed over, and therefore the possibility of this channel of infection must be considered.

Summary.—In summarising the second part of our subject, the connection between the nasal and naso-pharyngeal lymphatics and the rest of the body, as exemplified by the invasion of the tubercle bacillus, we are forced to the conclusion that further investigation and observation are still necessary. Certain anatomical and clinical facts, however, must be regarded as proved. The lymph drainage of the upper air-passages passes through the cervical chain of glands and enters the large veins at the root of the neck; further, the tracheo-bronchial glands derive their afferent vessels from the mucous membrane of the lower respiratory passages and pulmonary alveoli, while their efferent vessels pass to the large veins at the root of the neck and enter the blood-stream. No efferent vessels have been demonstrated between the deep cervical and the tracheo-bronchial glands.

Both experimentally and clinically it has been shown that tuberculous disease of the cervical lymphatic glands may be derived from infection of the nasal and naso-pharyngeal mucosa by the tubercle bacillus. As to the manner in which the bacilli pass from the cervical glands to the lungs two explanations have been offered: first, by way of the deep efferent cervical lymph vessels discharging into the thoracic duct upon the left side of the neck, and on the right side through the right lymphatic duct into the large veins, thence by the right side of the heart and pulmonary artery to the lungs; secondly, by an extension of the inflammatory process from the diseased inferior deep cervical glands directly to the pleura and apex of the lung. Experimental evidence has been brought forward in support of the extension of the tuberculous

disease by the first or anatomical pathway, but we have failed to bring forward pathological post-mortem data in support of direct extension from the cervical glands to the apex of the lung.

The fact that more than one portal of entry exists in the upper air-passages increases the difficulty in estimating the actual part played by the nasal and naso-pharyngeal lymphatics in distributing infection. Tubercle bacilli may be inhaled into the lungs and the cervical lymphatic glands may be secondarily infected by the bacilli in the sputum entering through the pharyngeal lymphoid tissue. Further, infection by inhalation may take place concurrently with infection of the cervical glands from the nasal mucosa derived from one and the same infective source. Again, the tubercle bacilli may pass through the mucous membrane of the upper air-passages and the cervical glands without leaving any evident trace of their passage, consequently this pathway of infection may clinically pass unnoticed.

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CAUSES OF THE PREVALENCE OF PULMONARY
TUBERCULOSIS IN SOUTH-EAST CHINA.

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BEFORE considering some of the more potent predisposing causes of pulmonary tuberculosis one must devote a few paragraphs to the support of the opinion assumed in the title of this article—one must give grounds for answering in the affirmative the question “Is tuberculosis common in South-East China?” Unfortunately it is not possible to adduce statistical evidence in support of an affirmative answer, and this absence of exact figures depends on causes which not only hamper our work, but also seriously conceal the vastness and urgency of the problem, namely, the absence of (*a*) death registration, and (*b*) post-mortem examinations in cases where the cause of death is not obvious.

If one tries to get light on this question by considering the records of the only place in South China where vital statistics are collected one again meets with difficulties, for deaths from chronic illnesses are relatively rarer there than elsewhere, on account of the desire of the Chinaman, when death is impending, to return to his ancestral home—usually in some distant village in China proper—so that no mention of his death is found in the records of the British Colony of Hong-Kong. But in spite of this emigration of people dying of phthisis, one-ninth of the adult Chinese deaths are due to this cause.¹ How much larger a proportion of the living must be affected.

In the absence (in China itself) of statistics one has to fall back upon one's own experience and that of one's fellow-medicals; but here, also, the figures available understate the case, because, as in Hong-Kong, one is not dealing with an unselected sample of the general population, and that for the following reason—native rumour and opinion, an intangible but most potent influence, say that while western medicine offers the best treatment for surgical cases, it is not so valuable for “internal illnesses,” so that (unless one is dealing with a well-educated or largely Christian population) medical cases, including phthisis, form but a small proportion of those whom one is called upon to treat. In spite, however, of this “holding back” as it were of cases of internal tuberculosis, most medical men appear to be

struck by the frequency with which they meet with such conditions amongst the Chinese. I think one is justified in saying that the large majority of the deaths amongst the preachers and teachers of missions in China are to be attributed to this "white plague."

My argument may be summarised as follows:—(a) If, in spite of the fact that most cases of pulmonary tuberculosis leave the island of Hong-Kong when they lose hope of recovery, 11 per cent. of the deaths there are due to tubercle, and (b) if, in spite of a "holding back" of *medical* cases from the practice of medical men on the mainland of China, they are still impressed with the widespreadness of this disease, then how inconceivably great must be the total havoc wrought throughout China by this maleficent bacillus.

Having seen, then, that tuberculosis *is* prevalent in South-East China, let us now proceed to examine possible reasons for this frequency. They will be dealt with under two main headings, namely:—I. Causes associated primarily with the bacillus. II. Causes that act mainly by rendering the individual more liable to sustain infection.

I. CAUSES ASSOCIATED PRIMARILY WITH THE BACILLUS ITSELF need not detain us long, but the following points may be noted:—

1. *The Habit of Spitting is very Prevalent.*—There are few habits of the Chinese more striking than the frequency and freedom with which they spit,² unrestrained either by a sense of the filthiness of the habit or by a knowledge of the dangers which it may cause to others.

2. *The Spitting is Careless and Promiscuous.*—In the north of China phthisis is said to be less common because every chair or cart contains a spittoon. This is very far from being the case in the south. Even in railway trains and the waiting-rooms at stations no conveniences are provided, and, still more deplorable, no one seems to notice their absence.

A careful man may endeavour to spit into the drain at the side of the road, but he frequently fails, and careful men are few and far between. In many homes no spittoon is provided, and even a bedridden patient suffering from phthisis may not think it worth while to provide such a receptacle for his expectoration, the ground suffices for his requirements.

3. *The Sputum of Tuberculous Patients contains Large Numbers of Living Bacilli.*—While generally acknowledging the truth of

this statement, we do not realise *how* great is the number expelled daily.

Some years ago the total daily expectoration of a hospital patient was carefully measured, diluted, thoroughly mixed, and a measured quantity of this emulsion of sputum was placed upon a slide, dried and stained. The tubercle bacilli in the whole film were then counted.* The result showed that this patient was expelling about 400,000,000 tubercle bacilli in a day. Granting the accuracy of Kitasato's demonstration that "most of the bacilli in the sputum are already dead,"³ it is obvious that if even a small percentage are alive, the number of *living* bacilli expelled daily will be enormous.

4. *Many of the Living Bacilli thus Expectored Meet with Conditions Favourable to their Longevity.*—Even in the cold season the sun can doubtless destroy in a few hours any bacilli exposed to its rays,⁴ and this bactericidal power must be exerted much more rapidly in the height of summer, but we have to bear in mind the habits of the people and their strong aversion to the rays of the summer sun. One thinks of the damp dark houses into which one goes from the blinding light of the sun, houses in which every opening which could let in a single sunbeam has been carefully closed up, one thinks of the narrow streets into which only the perpendicular rays of the meridian sun *could* penetrate, and one thinks of the way in which these same streets are actually roofed in so that even at noonday no ray can enter.

In South China (and particularly in the north-east part of the Canton Province, which is divided up in a most extraordinary way with water channels) the weather is *very* often warm and moist, hot without being bright—ideal conditions for the growth of all vegetable life—so one cannot wonder that the tubercle bacilli find ideal places in which to thrive.

As a connecting link between the conditions which are helpful to the bacillus and those which act by rendering man more liable to sustain infection, one must consider two very common methods whereby the bacillus is spread.

(a) By insects from sputum to food. *Bacillus coli communis* has often been recovered from both the feet and the intestine of the common fly,⁵ and living tubercle bacilli⁶ have also been isolated from the footmarks of flies that have settled on sputum.

* An oil-immersion lens, a mechanical stage, and an Ehrlich's eye-piece (*i.e.* a rectangular field) were made use of in this enumeration, which lasted three days.

In South China we have not merely this common fly, but also mosquitoes and other insects in abundance, insects which, in addition to their *special* power of conveying such diseases as malaria and filariasis, are quite capable of acting as purely mechanical agents in the spread of tuberculosis.*

(b) By social habits, from mouth to mouth. In addition to these natural means of conveying infection, abundant facilities for the spread of the bacillus are also offered by the social habits of the people. A host not only asks his guest to "drink tea" out of a cup which has not been properly washed for several days (and during that time has been used by scores of people), but he also invites him to smoke a pipe which is the common property of the whole household. Similarly, if a feast is given, a kindly host will use the chop-sticks that have been in his own mouth to place a choice morsel in that of his guest.

As tubercle bacilli have been demonstrated in the saliva of over 50 per cent. of cases of open tuberculosis,⁹ it is obvious that these social customs are attended with considerable risk.

II. CAUSES THAT ACT MAINLY BY RENDERING THE INDIVIDUAL MORE LIABLE TO SUSTAIN INFECTION.

The causes that act primarily upon the individual, increasing his susceptibility, may be grouped in various ways. In this article one will consider successively the effects produced upon the health of the individual by (a) the social conditions and customs of the people, (b) by the quality of the air they breathe, and (c) the food they eat, (d) by their clothing, and, finally, (e) by other diseases from which the individual may suffer—the effects produced by opium smoking will be dealt with immediately after the question of diet has been considered.

(A) *The General Social Conditions of the People.*—This may affect their liability to tuberculosis in at least four distinct ways.

(a) Probably nowhere does one meet with a larger proportion of people living *just* (only just) above the "starvation line" than one does in China. The majority of the population consists of families that can manage to "get through the day," but can lay by no savings to meet emergencies. Apart from the effect which this poverty has upon their diet (which will be dealt with

* It would be out of place to discuss here the relative importance of inhalation⁷ and ingestion⁸ as causes of tuberculosis, but so long as there is a possibility of the disease being acquired through the alimentary tract the above facts should be borne in mind.

presently), this hand-to-mouth existence is a most potent cause of that care and anxiety which are a man's worst enemies when he is fighting tuberculosis, and which one can readily believe make him more liable to succumb to the attacks of the bacillus.

(b) The fact that "love" is not a determining factor in arranging the betrothals in China should make it easier to secure a dispassionate consideration of such an important point as the health of the family and of the individual with whom an alliance is to be contracted. To a certain extent this is considered by both the principals engaged in matchmaking, but the betrothals are arranged and earnest-money paid at a very early age, and by the time the parties are old enough to be married phthisis may have developed and even reached quite an advanced stage in one or other of them. An engagement would not have been contemplated with one so obviously diseased, but as troths have already been plighted and good money paid over, the marriage is consummated.

(c) The degree to which considerations of etiquette cause young women to confine themselves within their own homes is another potent factor in the causation of tuberculosis. This injurious influence is most in operation at the ages at which most deaths are caused by this disease. If the older women were confined within doors the results would be less serious; if the young children were thus confined, although their health would doubtless suffer, the mortality from pulmonary phthisis would not be increased; but the confinement of growing women and young mothers cannot but be regarded as a powerful predisposing cause of tuberculosis.

(d) Finally, the effect of the long-continued theatrical performances—though relatively unimportant—should be borne in mind. As these performances rarely close before three or four o'clock in the morning, it is obvious that they must seriously undermine the health of those who habitually frequent them.

(B) *The Quality of the Air Breathed.*—This factor falls to be considered under two headings, namely, the air breathed by day and that breathed by night, the circumstances under these two conditions differing widely.

The quality of the air a man breathes *by day* will depend entirely upon his occupation. Is he a bread-winner? If so, does his work keep him in the open air, fishing, rowing, farming, gardening, or carrying loads? Or is he a merchant, occupied in an open shop? Or a clerk, shut up in an office keeping accounts?

Or, worst of all, freed from the necessity of earning money, does he spend his days poring over the classics?

If a man is employed inside a building, then the screens that are used to keep out the sun's strong beams (as well as the gaze of inquisitive passers-by) will tend to check the free exchange of air.

Unless a man's business keeps him in the open air he will not find much time nor have much inclination to take outdoor exercise. During the hot weather one cannot feel justified in ordering a man to take exercise during the heat of the day, and the absence of any twilight—as well as the fact that the sunset is the time at which the native here takes his evening meal—makes it a little difficult for him to enjoy a walk in the (relative) cool of the day.

However greatly the quality of the air breathed by different individuals may vary day by day, the conditions *at night* are more uniform; they almost all sleep in low one-storeyed houses—often one-room houses—and during most of the year within a thick mosquito net. As thieves are numerous, windows and doors are usually closed at night. Over thirty analyses were recently made to ascertain the effect of this defective ventilation upon the amount of carbonic acid gas in the bedroom, with the following results:—

		Parts of CO ₂ per 100,000.
In open air	.	40 parts.
In bedroom, door and window open	.	50 parts.
In bedroom, door shut, window open	.	130 parts.
In bedroom, door and window shut	.	220 parts.

* These results do not, however, adequately represent the prevailing conditions, for there was only one occupant in the room, the air of which was analysed, in contrast to the large family and collection of live stock usually found in a native bedroom, for not only is the whole family shut into the house, but the ubiquitous pigs, the cocks and hens, with the addition frequently of a cat and at least one dog, are also housed in the room, to use up the scanty supply of oxygen and to load the air with the organic matter which they expire at every breath.

The disadvantages of this style of living are so obvious that no more need be said about them. If bedridden patients in England—in order to fight against tubercle to the best advantage

—are advised to forsake for the open air the comforts of a well-ventilated bedroom (in which only one inmate consumes the oxygen and contaminates the atmosphere), by how much must the unhygienic surroundings of the people in South China handicap them in resisting this bacillus?

But the influence of the mosquito net is a more insidious factor in vitiating the air one breathes, and the writer recently made a series of tests in order to find out what effect the net had upon the quality of the air within it. Comparative analyses of the air on either side of the mosquito net showed that no obstacle was offered by it to the dissemination throughout the room of the expired carbon dioxide. Further investigations were therefore undertaken to discover whether the air inside the net was vitiated in other ways. It is well known that expired air contains in addition to an increased percentage of carbon dioxide certain effete products of metabolism, and a series of analyses was undertaken to determine the proportionate amount of these bodies in the air inside and outside the net respectively.

It was assumed that by shaking up a definite amount (100 cc.) of distilled water with a sample (5700 cc.) of the air to be examined a certain proportion of the organic matter contained therein would be absorbed by the water. About fifty measurements were made (on successive days) of the amount of oxygen required for the complete oxidation of the organic matter contained in samples of water thus prepared (*a*) from the air inside the net, (*b*) from that outside, with the following results:—*

State of Ventilation.	Temperature of Incubation.	Amount of Oxygen Required by Water Sample from Air:	
		Outside the Net.	Inside the Net.
Poorly ventilated.	15 C.	·00 mgrs.	·16 mgrs.
Well ventilated.	30 C.	·13 mgrs.	·59 mgrs.
Ventilation fair.	30 C.	·39 mgrs.	·65 mgrs.
Poorly ventilated.	30 C.	·41 mgrs.	·80 mgrs.

The table may be summarised by saying that on the average the air inside the net was twice as impure—as regards organic matter—as that outside the net.

* The analyses were made by Tidy's (Forchhammer's) method, the results of which depend to a large extent upon the temperature. Twelve analyses were made under each of the conditions indicated in the table.

When one considers, then, the effect of the closed windows and door and of the mosquito net upon the quality of the air breathed by the bulk of the inhabitants of South China, one sees how totally opposed their environment is to the principles underlying the present open-air methods of treating and of preventing consumption.

(C) *The Quality of the Food Consumed.*—This question is extremely important, almost fundamental. Of the different predisposing factors considered in this article diet is probably the one that is most amenable to modification by an individual, and the fault which he should remedy is the small amount of proteid in the food consumed.

While fully in agreement with Chittenden and his school that many of the "ills that flesh is heir to" are aggravated by an excess of the products of proteid metabolism in the blood, one cannot but feel that the average adolescent Chinaman contents himself with too little proteid.

One may investigate the question of diet by estimating the content of the food-stuffs in grammes of proteid, of fat, and of carbohydrate, and such a method of study is often necessary, but unless one also makes analyses of the faeces and finds out thus the amount of the food-stuffs which have been ingested but not assimilated, one is apt to be led into error. In many parts of China most of the proteid ingested is derived from vegetables, and a smaller percentage of this proteid is absorbed than of that which is contained in meat. Thus a study of diet sheets without faecal analyses is simply misleading.

As regards the nitrogenous foods the question may, however, be investigated in another way. Of the proteid assimilated a certain amount goes to build up the tissues, taking the place of an equal amount of proteid which has broken down and will subsequently be excreted in the urine; the remainder of the absorbed proteid, not being required for tissue formation, is metabolised into such bodies as urea, uric acid, etc., and likewise makes its appearance in the urine. Thus equivalents of all but a fraction of the proteid assimilated will be found in the urine, and an analysis of this will give us all the information required on the point we are now considering.

Examinations have recently been made of the total daily urine of over one hundred people—students, hospital employees, and patients on full diet—and the results of these analyses agree in showing the very small amount of proteid metabolism that takes place in the bodies of Southern Chinese.

Details of the analyses will be given elsewhere, but attention may be directed here to the excretion of urea and of uric acid in all these cases.

Urea generally contains about 90 per cent.¹⁰ of the total nitrogen excreted, and according to European and American text-books from 20 to 40 grms. of this may be excreted daily, 28 grms.¹¹ or 33 grms.¹²⁻¹³ being the mean. Eighty per cent. of the urines under consideration contained *less than 20 grms. per diem*, and the mean was only 12 grms.

In considering these figures it must, however, be borne in mind that the native of South China is shorter and less heavily built than the average European, so that one should compare the amount of urea excreted per kilogramme of body weight rather than the absolute amounts excreted *per diem*. In contrast to the European standard¹⁴ of .4 to .7 grms. per kilo., four-fifths of the cases under consideration gave less than .4 grms. per kilo., the usual figure being between .2 and .29 grms. per kilo.

A further point is that, owing to the increased amount of urine generally passed by natives in this part of China, the urea is excreted in an even more dilute solution than one would expect from the small amount of this body excreted daily. Thus in place of the urine containing from 2 per cent. to 3 per cent. of urea (*i.e.* the percentage generally met with amongst Europeans),¹⁴ the figures most generally found in the series of cases examined were from .8 per cent. to 1 per cent., and in over half the cases the urine contained less than 1 per cent. of urea, that is, less than one-half to one-third of the concentration met with in European urines.

May not this be taken to indicate that the blood of a Chinaman holds only from one-half to one-third of the amount of urea contained in the blood of a European? When one considers the extraordinary beneficial effects that have followed the use of urea¹⁵ in some tuberculous cases, the small amount of urea in the circulating blood cannot fail to impress one as an important factor in weakening the resistance to tuberculosis.

Similarly, uric acid (which has given excellent therapeutic results in cases of phthisis, and may be expected to have at least as powerful an influence as a preventive) is found in the urine of the natives here (and doubtless therefore in their blood) in much less amount than in Europeans. This is shown in the following table:—

Excretion of Uric Acid.	Standard given in Home Text-Books (14) (16).	Results of Analyses of 100 Chinese Urines.
Per cent. in urine.	·024-·060 per cent.	·016-·030 per cent.
Total daily amount.	·4-·7grms.	·2-·4 grms.

By administering either urea or uric acid in appropriate doses one can increase the amount of these substances in the circulating blood, and thus increase a patient's power of antagonising the tubercle bacillus, but the simplest and most natural way of thus increasing his capacity for resistance is by increasing the amount of easily assimilable proteid in his food—a method widely used in the treatment of tuberculosis.^{17, 18, 19}

The value of a diet rich in nitrogenous matter in preventing tuberculosis is shown by the rare occurrence of phthisis in gouty families: it is practically never met with in one who himself suffers from gout. This disease I have not met with, nor heard of, in the course of six years' practice in South China, and its absence indicates the lack of a prophylactic much to be desired.

Having thus demonstrated the defects in the diet of the Southern Chinese, let us proceed to consider the effect of opium.

The habit of smoking opium may weaken a man's power of resistance to tuberculosis in any one—or in all three—of the following ways:—

(a) A poor man can only purchase such an expensive drug as opium by *foregoing* the purchase of a certain amount of nourishing food. He is, as a rule, unable to confine himself to an amount of opium so small that the cost will not interfere with his ability to buy the amount of rice, etc., to which he is accustomed. Hence, on the one hand, the emaciated appearance of so many opium smokers (see also next paragraph), and, on the other hand, the idea held by many Chinese that while it is not wise for a *poor* man to smoke opium, there is no harm in a *rich* man's doing so.

(b) The opium habit has a deleterious effect upon the gastric juice, diminishing both the amount of hydrochloric acid and the pepsin; it thereby decreases the power of digesting proteid. Since, even in one who does not smoke opium, the amount of proteid assimilated is small (as has been shown by an examination of the urine), any *further* diminution in this cannot but be regarded as serious.

(c) Opium weakens the resistance to tuberculosis by diminish-

ing the power of the white blood cells to destroy living bacilli. This diminished phagocytosis has been experimentally demonstrated in cases of acute abdominal infections in which morphia has been administered; there is no reason to doubt that the same deleterious influence is exerted upon the blood by daily indulgence in the opium habit.

There is still another way in which indulgence in opium smoking renders a man more liable to become infected by the tubercle bacillus. The smoker generally spends several hours daily in an "opium den," which is not merely dirty and ill ventilated, but usually abounds with tubercle bacilli. The explanation of this latter fact is that the Chinese are quite familiar with the efficiency of opium in relieving many of the symptoms of pulmonary tuberculosis. Many a man who wishes to be cured of the craving for opium tells how the habit was first indulged in to check hæmoptysis, to secure relief from an intractable cough, to diminish "night sweats," or for some other well-known symptom of tuberculous disease.* It is the presence of advanced cases of tuberculosis in the opium den that makes these such important centres for the spread of tuberculosis.

(D) *The Clothing Worn*.—Another predisposing cause of pulmonary tuberculosis is to be found in the unsatisfactory nature of the wearing apparel of the natives.

Till recent years the clothes of the ordinary native have consisted simply of cotton, a material that is to be regarded as most unsatisfactory on account of its inability to absorb perspiration and to protect from cold winds. In the coldest weather the same material is used, with this difference, that the coat and waistcoat are made in two layers, the intervening space being padded with cotton-wool.†

* It may be gathered from the above that, in the opinion of the writer, it would be a profound mistake to assume that every emaciated tuberculous opium *habitué* owes his diseased condition to indulgence in this drug. It is quite as likely that, but for the relief afforded by opium and its powers as a "proteid-sparer," the patient would have succumbed to tuberculosis many years previously. During the "anti-opium crusade" that has been such a striking feature of recent years in China there have been few more pathetic incidents than the death of men still in their prime, in whom the sudden and ill-advised cutting off of the daily supply of opium has led to acute exacerbations of pulmonary tuberculosis.

† For the benefit of any readers not familiar with the habits of Southern Chinese it may be stated that the average native does not wear a shirt, but a series of coats, occasionally surmounted by a waistcoat. The number of coats is increased or diminished according to the temperature.

Recently there has been a considerable increase in the import of "health shirts"—garments corresponding to what would be under-vests in Europe. These are being much worn by the student and merchant classes, and, it is to be hoped, will make for relative freedom from chills, and therefore from bronchitis and other conditions that predispose to tuberculous disease of the lungs.

(E) *Other Diseases*.—In the first place, we may put aside the idea of there being any specific antagonism²⁰ between malaria and tuberculosis.*

One feels justified in assuming, on general principles, that the weakness due to chronic malaria and to other causes of tropical splenomegaly and anæmia must render the victim of these affections more likely to yield foothold to the tubercle bacillus. Ankylostomiasis is another condition which, by impoverishing the blood, weakens the power of resistance to the tubercle bacillus, a fact which is well brought out in Heisser's tables of mortality for Manilla,²¹ where it is shown that the death-rate from phthisis is twice as great amongst cases of ankylostomiasis as amongst the rest of the population. The seriousness of this condition as regards the occurrence of tuberculosis in South China will be obvious when one reports that about 60 per cent. of one's hospital patients harbour this parasite.

Apart from these general diseases there is one pulmonary condition which, though rarely met with in China proper, is very common in the northern part of the neighbouring island of Formosa, namely, infection with *distoma pulmonale*. I have only met with one case of this in China, and this patient showed simultaneous infection with the tubercle bacillus. This is only what one would expect, for where could an inhaled bacillus find a better nidus in which to settle and multiply than in the broken-down and bleeding patch of lung prepared by this distoma?

In conclusion, let us take a brief glance at the reasons which have been assigned for the prevalence of tuberculosis in South-East China. On the one hand, on account of the habits of the people and the climatic conditions under which they live, we have seen that living tubercle bacilli may be met with in large numbers

* This idea was probably due to its being noticed that sometimes Europeans who had been tuberculous in their own country improved when they went to live in India or other tropical region where malaria was common. The improved health is to be attributed to the greater purity of the air breathed in lofty bedrooms with widely opened windows, to the more "open-air" conditions of life in the tropics.

—may by the social customs of the people be transferred directly from mouth to mouth—and, on the other hand, we have noted that not only do the unhygienic surroundings amidst which the people live, and the mosquito net within which they sleep, seriously impair the quality of the air they breathe, but also that their dietetic habits and the illnesses from which so many of them suffer markedly weaken their power of resistance to the inroads of this omnipresent bacillus.

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UTERO-SCLEROSIS AND SCLEROSIS OF THE RECTO-UTERO-VESICAL FASCIA.

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UTERO-SCLEROSIS or utero-fibrosis and sclerosis of the recto-utero-vesical fascia are two distinct disorders, but as the tissue affected and the character of the pathological change in the uterus and in the pelvic fascia is essentially the same in both, and as, moreover, they occasionally coexist, we may with propriety and advantage consider them conjointly. Before discussing these two derangements a word or two regarding the anatomy of the uterus and of the recto-utero-vesical fascia will be serviceable. The middle portion of the uterus or that portion which is located between the mucous lining and the peritoneal covering constitutes the bulk of the organ; it is composed of bundles of muscular fibres, which interlace with each other, but the fibres separately and gathered into bundles are intermixed with fibro-areolar tissue. This areolar tissue is most abundant subserously or towards the peritoneal covering of the organ, and it is this tissue which is prone to become sclerosed. The recto-utero-vesical fascia is that portion of the pelvic fascia which is located below that band of fibres which stretches on each side of the pelvis from the lower part of the symphysis pubis to the spine of the ischium. It descends immediately in contact with the inner surfaces of the two levator ani muscles to the rectum, uterus, and urinary bladder. On reaching the latter organs it spreads over them and to a greater or less extent encases them. It enshrouds the rectum at about the level of the lower part of the 3rd sacral vertebra and is within easier reach of the finger during a physical examination of the pelvis per vaginam than the peritoneal folds known as Douglas's folds, for the latter are inserted into the posterior wall of the pelvis at about the level of the 2nd sacral vertebra. In the middle of Douglas's pouch the recto-utero-vesical fascia is extremely thin, and it displays here no tendency to become sclerosed, whereas the lateral thicker portions are prone to sclerosis.

Utero-sclerosis or utero-fibrosis is characterised by an overgrowth of the connective tissue of the muscular structure of the uterus. There is under such circumstances a marked increase in

the connective tissue, it may be in the connective tissue between fibres, but at all events in the connective tissue between bundles. With this overgrowth of connective tissue there is a correlative atrophy of the muscular elements, and consequently there may or may not be any very tangible increase in the bulk of the uterus. The atrophy of the muscular elements is in all probability secondary to the connective tissue overgrowth. This disorder may make its appearance at any time during the reproductive life of the woman, but it most commonly is observed between the ages of 35 and 45. Sooner or later the sclerotic change involves also the fibro-cellular tissue of the cervix.

The chief symptom is metrorrhagia, but occasionally the change going on in the uterus inhibits the menstrual function and amenorrhœic periods of five or six weeks are occasionally observed. In consequence of the defective muscularity of the uterus clotting of the blood may take place in the cavity of the uterus, and more or less organised blood clots are often expelled, and these products are apt to be viewed as remnants of a conception.

The derangement is a true fibrosis, and does not appear in any way to be inflammatory in character. It may make its appearance many years after a full-time parturition or an early abortion, but so far I have been unable to associate the disorder with any septic agency occurring in connection with a full-time confinement or an abortion.

Sclerosis of the recto-utero-vesical fascia is a disorder of some importance, since it is commonly a cause of infertility and even of sterility, as well as a not infrequent cause of dyspareunia. It resembles the disease known as Dupuytren's contraction of the palmar fascia. Sometimes the fascia is more or less thickened and contracted merely, but often it presents nodulations. It is not an inflammatory change, and it seldom, if ever, involves the mucous membrane of the vagina. The fibrous tissue causing the contraction is a very coherent fibrillar tissue like tendon tissue. It is not dependent upon any traumatic influence, but is probably due to some bacterial product absorbed from the vaginal canal and circulating in the blood. It is a derangement which may appear at any time during the reproductive life of the woman after the age of 21.

It must not be confounded with puckerings of the vaginal roof dependent upon old adhesive peritonitis.

OBITUARY.

JOSEPH BELL.

IN 1776, a young man, Benjamin Bell by name, having served his apprenticeship with Mr. Hill, a surgeon in Dumfries, came to Edinburgh to study medicine. He was the first of a long line of surgeons of whom the subject of this notice was the last.

Benjamin Bell was a remarkable man. Within two years of his arrival he was house-surgeon in the Royal Infirmary, and he was on the regular staff before he was 24. His success in practice was so great that when he died, at the age of 57, in Newington House, he was proprietor, in addition to estates elsewhere, of the greater part of what we now know as Newington. Blacket Place and Middleby Street commemorate this connection, for Blacket House was the home of his ancestors, and Middlebie their parish.

He must have been no ordinary man. Laid aside from practice early in his career by injuries due to a fall from his horse, he took a farm at Liberton, where he spent two years. He studied the growth of wheat; he studied economics, on which subject he corresponded with Pitt and Adam Smith; he wrote a series of essays on the Corn Laws and cognate subjects, which he afterwards published; and in addition to all this he wrote a *System of Surgery* in seven volumes, which actually reached the unusual distinction of a seventh edition. He was offered, and declined, a baronetcy.

He had several sons, one of whom, George, succeeded his father in practice and as surgeon to the Royal Infirmary, while the youngest, Joseph, also entered the medical profession; and thus began the alternation of Benjamin and Joseph Bell as Edinburgh surgeons.

The last Joseph Bell was born in 1837 at 22 St. Andrew Square, then a fashionable centre, and was educated at the Edinburgh Academy, where he had among his class-mates Sheriff Donald Crawford, Professor James Candlish, Mr. Montgomerie Bell, and Colonel Andrew Murray of the Seaforth Highlanders. Games were not so prominent a feature in school life then, but he played "hails" with the rest, and was sufficiently keen on cricket to keep it up after he left school, with the Academicals.

He entered the University when he was 16, and passed his final examination before he was 21. After graduation he took a short trip to the Continent, but the schools there did not attract him, and he soon returned to settle down and take up his life's work in his native city.

He was house-surgeon with Syme and house-physician with Gairdner; he demonstrated anatomy under Goodsir, and then at the

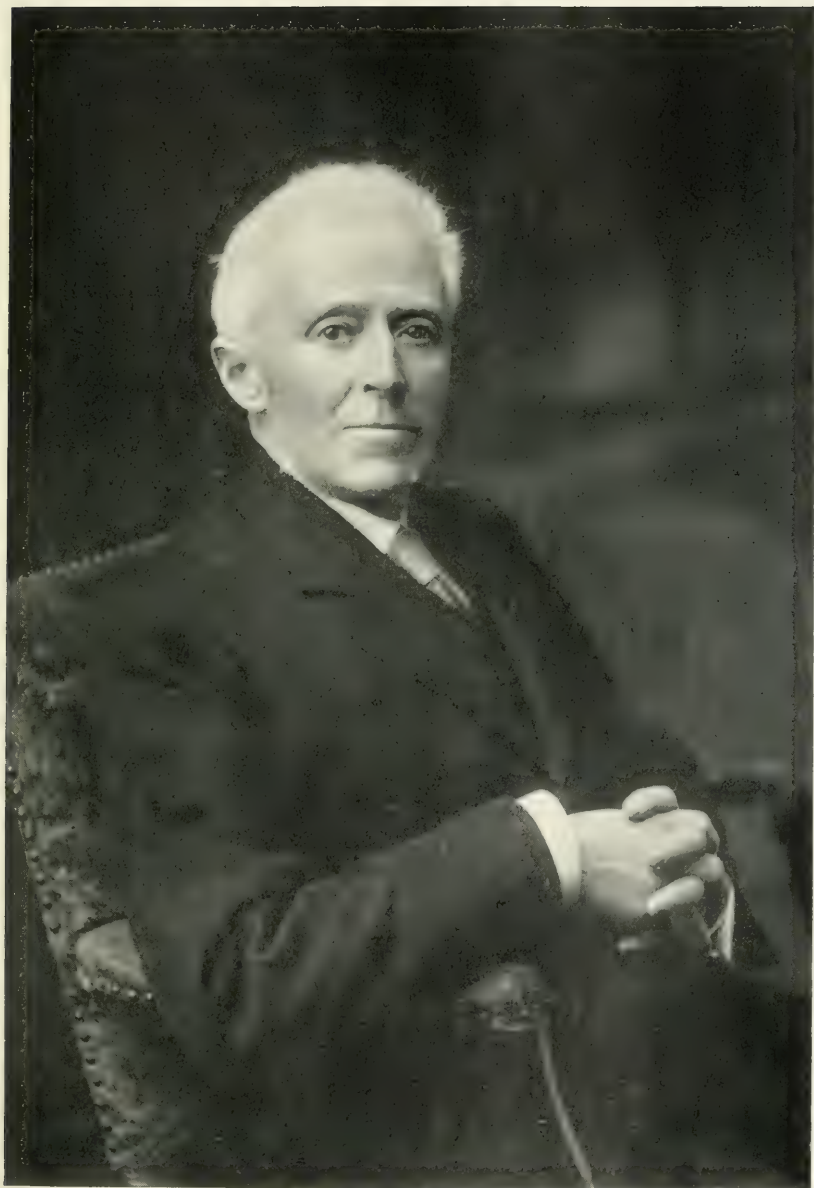


Photo. by Horsburg, Jr.

age of 26 he began to lecture on systematic surgery in Surgeon Square. He continued this course till, on reaching the post of senior surgeon to the Infirmary in 1878, he became eligible to teach the subject of clinical surgery in friendly rivalry to the professor of that subject. His connection with the Royal Infirmary was a long one. He was resident 1859-60, in 1865 he was appointed a special assistant to Mr. Syme, and in 1869 assistant surgeon to the Institution. He became an ordinary surgeon in 1871, and retired, having served his full term, in 1886.

Syme was his hero, and Syme held his young assistant in such high esteem that on one occasion he introduced Mr. Annandale and Mr. Bell to a distinguished visitor as the future professors of surgery in Edinburgh.

The large classes which he attracted testified to his capacity as a systematic teacher, but it was as a clinical teacher that Bell was in his element, and his theatre and his wards were always crowded. The interesting fact, to which so much attention has since his death been directed, that Conan Doyle from him drew the inspiration of Sherlock Holmes has spread a far too wide impression that Bell was a superficial teacher. Nothing could be further from the truth. Behind these lightning diagnoses lay sound knowledge, and the students who followed him can look back on wise suggestions and prophetic hints which time has verified. The writer can remember to-day the *ipsissima verba* of many of Bell's clinical lectures, and recognise, as he did not then, the wisdom which they contained. Bell's out-patient clinics were perhaps the outstanding feature of his teaching. Swinging rapidly along the corridor with his own peculiar gait, flapping the towel which he always carried, he dashed into the theatre, and, sitting down, spread the towel over his knees and began. Woe to the out-patient clerk if the cases were not ready. There was great variety in surgical out-patients in those days. Eyes, skins, ear and throat, or gynaecological cases—he was ready to tackle them all and to teach us something from each of them. Of his work as a surgeon Professor Caird has written: He used the spray, as everyone did in those days, but he was, perhaps unconsciously, ahead of it. While some of his colleagues wore, year after year, the same coat for operating in, Bell operated as he was, with his sleeves turned up, and his cuffs and his hands were always clean.

When the time came for him to retire from the Infirmary he was only 49. Fortunately the directors of the Children's Hospital realised their opportunity, and founded a surgical charge which he filled with much success for ten years.

He took an active part in medical affairs, and filled almost without exception every post to which the medical profession in Edinburgh could elect him. He was an Examiner for the Royal College of

Surgeons for forty-two years, Treasurer for eleven, and President 1887-9. He represented the college on the Triple Board until last year, and his quaint, sensible remarks smoothed over many difficulties. He was for some years chairman of the Governing Board of the School of Medicine of the Royal Colleges.

He was in turn Secretary, Vice-President, and President of the Medico-Chirurgical Society. In his address as President of the Harveian he dwelt with pardonable pride on the long association of his family with the society. He was a manager of the Royal Infirmary for ten years, and he was the mainspring of the Queen Victoria Jubilee Institute for Nurses from its foundation till he died.

Perhaps of the many posts he filled that of Assessor to the University Court was the one he valued most. Next to the Chancellor (Mr. A. J. Balfour) he was the senior member of that body, and his work upon it was much appreciated by his constituents. Two years ago he was elected, much to his gratification, a curator of patronage, but it so fell that he never had occasion to take part in the filling of a medical chair.

He was not a very prolific writer. Two minor works which he wrote—*A Manual of the Operations of Surgery*, and *Notes on Surgery for Nurses*—were very successful, and went through edition after edition. In his early days his fancy turned in the direction of general literature, and he wrote an article on "Old Houses," which appeared in the *Cornhill Magazine*. It attracted a good deal of attention, and he was pressed for more copy of a similar sort, but this first essay was his last.

In politics he was a Conservative, and succeeded the late Professor Annandale as Chairman of the University Conservative Association.

All his life he was attached to Free St. George's, and he was hardly ever missing from his place in church. He died the senior elder of the congregation.

His generosity no one can measure. It was all done so unostentatiously, so tactfully, that none but the recipient knew of it.

Success in practice came to him soon, as it was bound to come to one with such an ancestry. His great-grandfather, in 1796, addressed these words to a young surgeon just starting practice, "Be not afraid of your ultimate success. I have never known an instance of anyone, in any profession, who did not succeed if he was sufficiently qualified, of industrious habits, and honourable in his conduct towards those who employed him."

He started housekeeping at No. 5 Castle Terrace, a house which has continuously since been occupied by a succession of medical men, and has acquired the reputation of being a lucky house. From there he moved to 20 Melville Street, and finally, in 1880, to No. 2 Melville Crescent. He had no ambitions for Charlotte Square.

He married in 1865 Miss Erskine Murray, a daughter of the Hon.

James Erskine Murray of the Elibank family. She died in 1874, leaving him with two daughters and a son. The daughters are married respectively to Captain M'Cance and Major Stisted, and were with their father during his last illness. His only son, who was, of course, christened Benjamin, seemed destined for the medical profession, but his inclinations turned him to the Army, and he joined the Seaforth Highlanders. If Bell ever regretted this break in the line he never spoke of it to anyone. He was devoted to his son, and when the young soldier was cut off, by appendicitis, in 1893 Bell appreciably aged.

His health broke last spring, when his condition for a time gave rise to the gravest anxiety. But his mercurial optimism rose over his troubles, and during summer he was able in a quiet way to enjoy life again. His last illness was brief and comparatively painless.

Free St. George's was crowded with those who came to do honour to his memory, and he was laid to his rest in the Dean Cemetery, where lie so many of Edinburgh's famous men. So ends the famous line of the Bells, surgeons in Edinburgh. They served each of them his generation, and their works follow them.

At our request the following men, who were closely associated with Dr. Bell in various capacities, have written appreciations of his work :—

SIR WILLIAM TURNER.

I made the acquaintance of Joseph Bell in 1855, when he began the study of medicine in the University. I remember his youthful figure, alert movements, and bright nature, keenly alive to his work and energetic in its pursuit. Mindful of his descent from a long line of eminent practitioners in Edinburgh he was ambitious to excel and to continue the reputation of his family. To be a surgeon was his aim from the first, and he attached himself to Professor Syme, the great clinical teacher in the middle of the last century, with whom he was a favourite pupil. After graduating as Doctor of Medicine in 1859 he became Syme's house-surgeon and assistant. His graduation thesis was "On Epithelial Cancer," for which he received commendation by the Faculty of Medicine. Acting on the precept strenuously enforced by Syme that a good knowledge of anatomy was the foundation of success in surgery, Bell obtained from Professor Goodsir the appointment of Demonstrator of Anatomy in the University, an office which he held for two years. Whilst discharging its duties he acted as my junior, and acquired a well-deserved popularity amongst the students from his powers of observation, his clearness of exposition, his capacity for taking trouble to help them in their difficulties, and by his words of encouragement. In 1863 he became a Fellow of the Royal College of Surgeons of Edinburgh, and shortly afterwards he

received from his College the licence to teach surgery in the Edinburgh School of Medicine. The same qualities of mind and of person which made him so successful a teacher of practical anatomy served him in good stead, not only in teaching systematic and operative surgery, but later on, in his work as a clinical teacher, when he became full surgeon to the Royal Infirmary. The regulation which requires an ordinary surgeon to the Infirmary to demit office after a certain number of years of service, in the case of Joseph Bell was a distinct loss to the school and to himself, as it removed from the list of teachers one who, from having been appointed when young on the surgical staff, was still in the plenitude of his experience and powers when the time for resignation was reached.

Other friends and colleagues have testified to Dr. Bell's qualities as a hospital surgeon, to the confidence which he inspired in his patients, to his benevolence, and to the philanthropic work which he undertook in so many directions and for so many institutions with which he was associated. I should like to refer to my experience of him as an administrator of the affairs of the University. By the Act of 1889, the University Court was enlarged, and four assessors had to be appointed by the General Council; Dr. Bell was chosen in 1895 by his fellow-graduates as one of their representatives, and he continued in office up to his death. His experience as a teacher and practitioner during so many years had given him a great knowledge of the medical school and an experience in public questions affecting medicine as a profession. His opinion on such matters was greatly valued by his colleagues on the University Court, and throughout his sixteen years of office he proved himself to be a loyal son of his Alma Mater. He retained to the last his quickness of apprehension, the power of expressing his views with brevity and lucidity, and the geniality and heartiness which had characterised him throughout his long and useful life.

LORD STORMONTH-DARLING.

I am asked by the editor of the *Edinburgh Medical Journal* to give him something in the nature of an "Appreciation" of the late Dr. Joseph Bell. I certainly cannot say "No" to that request on the ground that my acquaintance with him was too slight to justify my attempting it, for I was his colleague for three years on the University Court when I was Solicitor-General for Scotland, and afterwards for nearly eighteen years after I went on the Bench until I resigned my office in October 1908. During all that long period there were questions from time to time arising—including the medical education of women—on which differences of opinion might quite well have arisen, yet I never knew a difference to arise which could not be bridged over by moderation of view, and especially by a whole-hearted regard to the interests which, as members

of a University Court, we were all bound to regard as our first, and indeed our only, duty. In that endeavour we had first the inestimable advantage of the counsel and guidance of the most discreet of Principals, and next the advice of one who succeeded so wise a counsellor as the late Dr. John Duncan. Dr. Joseph Bell, who succeeded Dr. John Duncan, was indeed so wise a counsellor, had so level a head, and so perfect a temper, that it was impossible to take offence at anything he said. Moreover, he had a fund of humour which was not so much a fund as an inspiration.

SIR JAMES AFFLECK.

I should like to be permitted to make a brief reference to two of the directions of Dr. Bell's life-work which I had special opportunities of observing and appreciating:—

1. Dr. Bell's connection with nursing was a long-continued, intimate, and sympathetic one. At the outset of his hospital career the old system was still in operation, and many racy stories he could tell of the way things were done under that *régime*. His promotion in 1871 to be a surgeon in charge of wards coincided with the introduction of the new system of nursing imported from St. Thomas's Hospital, which marked the beginning of a revolution in the nursing arrangements of the Royal Infirmary, and has produced unspeakable benefits alike to patients and working staff. Recognising the importance of training their observant faculties, Dr. Bell regularly took the nurses round his wards early on the Sunday mornings, and many yet recall with gratitude the valuable lessons then taught them which proved so helpful in their future work. Dr. Bell became early connected with the Queen Victoria's Jubilee Institute for Nurses, and was one of the most active members, as well as Chairman of the Committee, of the Scottish branch. In addition, he was President of another of the large nursing institutions in Edinburgh, and rendered great service by his active interest in all its affairs. It may be truly said that the development of modern nursing among us owes much to Dr. Bell—more, indeed, than he has ever received credit for. Further, his interest in the welfare of nurses who had come under his observation could be testified to by many who benefited by it, while his personal acts of kindness and generosity to those in sickness or other need were manifold, yet, like all his other benefactions, were mostly done in secret.

2. Dr. Bell was one of the Committee which was formed in 1874 to establish the Association for Incurables in Edinburgh, and he continued to act as surgeon to what is now the Royal Edinburgh Hospital for Incurables to the end of his life. The interests of this institution lay near to his heart, and its progress and success have been in no small

measure due to his unwearied efforts, not only as a medical officer, but also as one of the active members of the board of management, of which he was the chairman. His regular visits to the Longmore Hospital were much enjoyed by the patients, to whom his happy way and kind and cheering words oftentimes brought heart and sometimes even hope in their days of weakness and suffering.

DR. JOHN PLAYFAIR.

Much has been said and written of the worth of Joseph Bell as a citizen and of his ability and skill as a surgeon, but as one who was much with him during the last months of his life, and who was on terms of intimate friendship with him for many years, let me add something in appreciation of his demeanour as a patient, of how he bore his last illness, and of the courage and composure with which he faced the end.

It was characteristic of the man that he kept at his work even after symptoms of a grave and serious nature had developed. On a Sunday morning in February last he went out, as was usual with him, to see one or two patients before going to church. Increasing breathlessness and other distressing symptoms compelled him to give in and seek the rest in bed which his condition urgently required. The expected improvement did not occur, and two days later heart failure threatened, and a night of great suffering and distress followed. Almost as a last resort, and not without some doubt as to the safety of the procedure, a small dose of morphia was given subcutaneously. Immediate relief followed, with gradual restoration to a small measure of health and strength. In time he was able to move to his beautiful country residence, Mauricewood, and there, in the enjoyment of the flowers and trees he loved so well, and in the company of loved and loving relatives, he passed the remainder of his days on earth.

During all the weeks and months of his illness never a murmur nor fretful word was heard from him, and his cheerfulness, even after a bad and restless night, was remarkable. I shall never forget, at the morning visit, and in response to my knock at his bedroom door, the loud and cheery "Come in," or "Come in, dear boy, so glad to see you." Then he gave me, and with many humorous touches, a description of his night—the vivid and extraordinary dreams he had had, and the expedients he and his devoted nurse had resorted to to wile away the long and dreary hours of the disturbed night.

All orders and suggestions were gratefully and readily accepted and carried out with unfailing punctuality—this, too, although he was no ardent believer in the power of medicine. He felt he was now the patient, and his strong sense of duty and his loyalty to his doctors made him put aside his own opinion and give implicit obedi-

ence to all that was desired of him. Early in his illness it was manifest to all of us, and without doubt he saw it clearly too, that the best that could be hoped for now was a life of quiet invalidism. To a man of his great energy and mental activity this might have been a cause of much depression. It was not so with him. He accepted the outlook with perfect resignation and composure, uttering no word of vain regret or irritation. When an unfavourable turn in his illness came, and he began to feel the end might be drawing near, he calmly and quietly asked us what we thought his prospects of life now were, requesting us to state our opinion plainly and frankly and to keep nothing back. A strong, simple Christian faith sustained him, not only then but through some of life's severest afflictions, and enabled him with a rare and lofty courage unshrinkingly to contemplate and prepare for the inevitable.

PROFESSOR CAIRD.

With the passing of Joseph Bell many grateful memories arise amongst the many who attended his thronged clinics in the New Royal Infirmary, or who acted as clerks and dressers under him in the historic old building at the foot of Infirmary Street. They recall with pleasure and admiration the enviable punctuality and despatch with which his hospital duties were discharged; they think of the atmosphere of *bonhomie* and kindness with which he surrounded his following of staff, students, and patients; and above all they remember him as a good and talented surgeon, shrewd, deft, and scholarly, who linked the older methods of the loved days of Syme with those of modern advance.

Bell was an excellent operator, dexterous, rapid, and neat. His manipulative skill and gentle touch were specially prominent in cases of urethral trouble, of hernia, and of amputation. He never lost sight of the wholesome tradition that the sooner the patient was off the table, back into bed, the better; nor did he miss an opportunity of enforcing this in the numerous "primaries" that fell to his care.

His diagnostic acumen, his keen powers of observation, his skill in eliciting facts, his sense of humour, enlivened many a charming clinic, and sent his delighted hearers away conscious that their time had been well spent, and that they had indeed learned much from an able surgeon who was apt to teach, tactful, impressive, and of ripe experience.

Bell appealed to students as one who was anxious to make them realise the value of their hospital work, and the bearings it would have on their future as successful practitioners. He was ready to help and was unobtrusively generous.

Brief, lucid, almost epigrammatic in the use of his words, he was

equally smart and efficient with his knife. Ever ready, but never rash, he has left behind him the reputation of a good and sure surgeon who did much to enhance the reputation of our Medical School.

DR. MACKENZIE JOHNSTON.

Dr. Joseph Bell was the son of a former President of the Royal College of Surgeons, Benjamin Bell, and became a Fellow himself in 1863. His grandfather and great-grandfather also were Fellows of the same College, and it is interesting to note that from 1771—140 years without a break—there has always been on its roll of Fellows either a Benjamin or a Joseph Bell.

Bell became Secretary and Treasurer to the College in 1876, and ably performed the onerous duties of this office for eleven years until he was elected President, which position he held from 1887 to 1889. Perhaps the greatest service which he rendered to his College was in the work performed as a member of the President's Council, where his business capacity, his ripe experience, and his knowledge of the College affairs were invaluable. He often asked leave to make way for younger men, but it was felt that he could not be spared, and hence he remained on the Council for the long period of thirty-five years. Such a record of work done for the College must be quite unique. As an Examiner for forty-two years, as Chairman of the School of Medicine, as a member of the Triple Board, and in many other capacities Bell has served his College faithfully and well.

In the space of a short paragraph or two it is difficult to do justice to Bell's influence and work in the College of Surgeons. It is not too much to say, however, that no important question considered by his College in the past forty years but has been helped by his sage advice and his shrewd criticism.

The writer of these lines has good cause to think with affection of Joseph Bell, from whom he has so often obtained sound advice, loyal support, and much encouragement in his official duties, and by whose death the College of Surgeons has lost a pillar of strength, a true friend, and a wise counsellor.

DR. C. E. DOUGLAS.

Joe Bell was a supreme example of a type that, for good or ill, is passing fast away, the type of the general practitioner who develops a specialty. For those of us who worked as house-surgeons under him there will arise at this time the impression gained whilst serving with him in the daily round, and the memory of him deepening in its perspective as the years have fallen upon us. He was Conservative all through, with a fine touch of hauteur when faced with the uncon-

genial, and ever with a fond look back to the days and men that were, but with a scholarly breadth of view that redeemed him from any narrow-mindedness, and the impression he made on me was that of a cultured gentleman who for his calling pursued the craft of the surgeon.

The memory he leaves behind him as one thinks of him in relation to the men of his time is that *par excellence* of a brilliant personality. He was so many sided. The children, the women patients, the nurses all loved him for his kindness, his quick and ready sympathy, no one of them more so than she who knew him so well, his right hand all through his long service, his beloved staff nurse, Jeanie Dickson, on whose judgment he relied far more than on that of most of his residents. Men admired and respected him as a helpful friend, or, if occasion arose, a worthy foe. He was never a man to trifle with, as the bagman found who pushed his way into the side room after visit, an out-patient who disdained to mingle with the common herd at the clinic, and who found himself suddenly taken by the scruff of the neck and promptly ejected by the irate "chief." A Sherlock Holmes would have recognised at once his prototype. The piercing eye that took in everything, sizing up his man in an instant; the clear-cut mobile mouth; the beautiful hands, strong, supple, dexterous; the quick alert step with its curious halt, in itself an honourable scar, the result of post-diphtheritic paralysis contracted through a heroic act—these all stamped him for what he was, essentially a man of action. He was one who felt to the full the joy of life; yet he, too, had his great sorrows. The jet black hair went iron grey in three days of anguish; and those who knew him in '74 think that he was never the same man after the death of his beloved wife. He was the last of a long line of surgeons, each of whom served well his day and generation; and another strand is broken of the cord that joins the Edinburgh of to-day with her mighty past.

MEETINGS OF SOCIETIES.

Forfarshire Medical Association.

A MEETING of the Forfarshire Medical Association was held in the Physiology Class-Room, University College, Dundee, on Friday, 13th October. Dr. Angus MacGillivray, a Vice-President of the Association, occupied the chair. Six new members were declared duly elected.

The chairman then called on Dr. G. A. Gibson, Edinburgh, to deliver the Inaugural Address of Session 1911-1912. Dr. Gibson took as his subject "The Medical Aspects of Certain Social Questions." He first dealt with the Insurance Bill. While he had a feeling of sympathy with its aims and allowed that it would deal with matters which had

been scandalously neglected in the past, still it might have gone further in providing for the widows and children of workmen. There were, however, points in the Bill of which medical men could not approve. The discussions on the Bill had taught the medical profession its power, and had shown it its solidarity. As a result, however, of the Bill a new order of practitioners might conceivably arise, not on such a high level as the present order. Another line of action in legislation would be the shutting out of the criminal alien and the derelict. Legislative measures might also be based on the science of eugenics. Hitherto the medical man has attempted to deal only with environment, leaving heredity entirely out of account. The medical man should preach on every occasion the gospel of a healthy stock. Dr. Gibson then spoke of the importance of physical training and the education of children in matters affecting the Empire and the State.

Dr. Sinclair proposed, and Professor Stalker seconded, a vote of thanks to Dr. Gibson for his exceedingly interesting and suggestive address.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH,
ROYAL COLLEGE OF SURGEONS OF EDINBURGH,
AND ROYAL FACULTY OF PHYSICIANS AND
SURGEONS OF GLASGOW.

THE following Candidates, having passed the requisite examinations of the above Board in October, were admitted Diplomates in Public Health:—

A. P. Granger, Glasgow; G. L. Cawkwell, Auckland, N.Z.; W. H. Dickinson, England; W. L. Burgess, Aberdeen; W. L. Martin, Edinburgh; J. A. Clarke, Glasgow; W. L. Johnston, Greenock; J. M. Taylor, Kirkintilloch; J. S. Peebles, Dundee; W. H. Mackenzie, Dunkeld; L. Grant, Johnstone; R. A. Krause, Innsbruck; D. G. Robertson, Melbourne; T. H. Balfour, Portobello; W. S. I. Robertson, Blair Atholl; Jessie Alexander, Leith; J. M. Campbell, Kirkcaldy; W. J. Feltham, N.Z.; and R. T. Young, Glasgow.

Final Examination.—The following candidates passed the Final Examination and were admitted L.R.C.P.E., L.R.C.S.E., and L.R.F.P.&S.G.:—

J. J. Bell, Belfast; R. T. Bayley, British Guiana; R. C. Fuller, Ireland; J. A. Jones, Wales; S. Hoashoo, S. America; A. B. Arora, India; H. R. Macnabb, Co. Down; T. S. Nair, India; W. J. Moore, Dunoon; J. P. Synnott, Ireland; B. L. Shome, Calcutta; A. N. da Silva, Portuguese India; and D. A. Evans, Wales; and 12 passed in Medicine and Therapeutics, 12 in Surgery and Surgical Anatomy, 9 in Midwifery, and 10 in Medical Jurisprudence.

RECENT LITERATURE.

CRITICAL SUMMARIES AND ABSTRACTS.

MEDICINE.

By J. S. FOWLER, M.D., F.R.C.P.

THE PREVENTION OF EPIDEMICS OF INFANTILE PARALYSIS.

ALTHOUGH this country has been spared any such extensive outbreaks of acute poliomyelitis as have visited America and Scandinavia, a number of limited epidemics have occurred, and the disease was unquestionably unduly prevalent during the summer of 1910. It has, if we mistake not, been made notifiable in certain districts, and any measures of a preventive nature demand attention. Allen Starr deals with these in a recent paper (*New York Med. Record*, 5th August 1911). It is believed that the disease was disseminated throughout America by Scandinavian immigrants, and Flexner's researches show that it is due to an as yet unknown infectious agent which is present in the cerebro-spinal fluid and probably in the blood of patients. It is communicable, and the infectious material exists in the nose and throat. It is probable that it is through the inhalation of infectious particles which lodge in the mucous membrane of the nose and throat that the infection enters the system. Granting these facts, the following are the means of prevention:—(1) Isolation of patients as if suffering from diphtheria or scarlet fever (including disinfection of clothes, utensils, etc.). (2) Disinfection of the nasal and buccal mucous membranes by means of sprays of boric lotion. (3) Spraying of the noses of children who are exposed—*e.g.* as when a case occurs in a school. (4) As the contagious material persists for several months in the nasal secretion of patients, disinfection of the nose should be kept up for three months. (5) Urotropin given internally to monkeys which are subsequently exposed to the infection of this disease lessens their liability; given immediately after inoculation it mitigates or even prevents the symptoms. Urotropin should therefore be given early—as soon as the disease is suspected; it ought also to be given to children who may have been exposed. The early application of these preventive measures depends on the prompt recognition of the disease, hence prophylaxis is unquestionably a diagnostic problem. An absolute diagnosis can seldom be made within the first three days, but in Starr's opinion it is imperative, when there are indefinite febrile symptoms and poliomyelitis is known to be prevalent, to administer urotropin and disinfect the nose without waiting for an absolute diagnosis. For a child of 2 or 3 the dose is 2 grs. every six hours; for

a child of 6 to 10, 3 grs. Unfortunately the blood-count in the early stage is not of any diagnostic value, but lumbar puncture may give some information. In several cases examined on the third day some changes were found. The amount of cerebro-spinal fluid was slightly increased, so that on puncture the flow was more rapid than normal. The fluid was either quite clear or (more frequently) slightly opalescent, and contained a few lymphocytes and polynuclears. The fluid also gives a protein reaction with Noguchi's butyric acid test. These changes apparently occur before paralysis develops. The protein reaction is not present in tuberculous meningitis. It is not unlikely, therefore, that by lumbar puncture an early diagnosis may in the future be possible, and if urotropin be promptly given the symptoms may be mitigated.

PROGRESSIVE LORDOTIC DYSEASIA.

Under the somewhat cumbrous name "Dysbasia lordotica progressiva, dystonia musculorum deformans" Oppenheim (*Neurologisches Centralblatt*, 1st October 1911) describes a remarkable nervous disease, the significance and classification of which present many difficulties. He has met with several cases within the past five years, and in the earlier of these his diagnosis wavered between hysteria and idiopathic bilateral athetosis, but further experience convinces him that the disease is a special one. He gives the notes of four cases, and from them and some others outlines the clinical picture. Children from 8 to 14 years are affected, without predilection for either sex. All his cases have been in Russian or Galician Jews. The disease develops gradually, the symptoms beginning as a rule in the arms and soon extending to the legs; the muscles which are invariably most affected are those of the thigh, pelvis, and spine which come into play in walking. The disease is, in fact, a special type of astasia-abasia. When the patient is lying down the signs that anything is wrong are few and insignificant, but if he stands, or still more when he attempts to walk, the symptoms are striking; then the outstanding feature is marked lordosis or scolio-lordosis, with great inclination of the pelvis and projection of the buttocks. Even when the patient is standing the legs are kept slightly flexed at the hips and knees, and he may be driven to support the weight of the body mainly on one leg. When he walks the anomalous attitude is accentuated. The gait is, Oppenheim states, the most peculiar and striking he has come across—much more remarkable than is ever seen in either poliomyelitis or dystrophics—so remarkable as to arouse, at first, the idea of acting or of hysteria. The lordosis increases, and the back is thrown back or bent forward and to one side. This is carried to such an extent that the trunk may be almost horizontal, and the patient is compelled to support himself either by a stick or by placing his hands on his thighs. The position during

walking is not stable, but alters with progression in a somewhat regular systematic manner. A gait of this kind is naturally exhausting, and after a few steps the patient flushes and perspires, and the muscles begin to tremble from fatigue. Having observed this extraordinary mode of progression, it comes as a surprise to find that when the patient lies down on his face or his back most of the symptoms disappear. The lordosis usually goes completely; the spasm of the legs may not relax quite completely, but, at most, slight eversion or inversion persists. It is, however, obvious that the anomalous muscular action is almost exclusively bound up in the act of walking. Implication of the arms is chiefly shown by cramps associated with writing. On examining the patient while at rest (lying down) there is no paralysis, and active movements in all directions can be performed without difficulty. There is nothing in the way of athetosis, though slight passing tremors of some of the muscles may occur. Some muscles, however, show slight tonic spasm, especially the biceps in the upper arm and the rotators of the thigh. None of these, however, seems to be an essential feature of the disease. What is very remarkable is that on testing the passive movements of the limbs there is well-marked hypotonicity, alongside of the above tonic spasm of isolated muscles. The tendon jerks are markedly enfeebled in most cases. In other respects the findings are negative. The disease therefore consists of an alteration of the muscular tone—on the one hand hypotonia, on the other a tendency to tonic contraction, which, however, is chiefly manifested during standing and walking. The disease is a steadily progressive one. It bears some resemblance to chronic chorea and to bilateral athetosis, but Oppenheim thinks it is essentially different from these, though possibly cases intermediate between it and athetosis may exist. He believes that it is an organic, not a functional, disorder, due to fine changes in the regions of the nervous system which control muscle tonus. Oppenheim suggests as the best name, *Dystonia muscularis deformans*—"dystonia" to imply the association of hypo- and hyper-tonia.

UROBILINURIA IN THE DIAGNOSIS AND PROGNOSIS OF CROUPOUS PNEUMONIA.

Hildebrandt (*Zeitschr. f. klin. Med.*, Bd. lxxiii. Hefte 3-4, 1911) points out that in uncomplicated croupous pneumonia urobilinuria is a constant occurrence, and proposes to utilise this fact in diagnosis and prognosis. Urobilin results from the action of reducing bacteria of the intestine on the bilirubin and biliverdin of the bile. Normally it is taken up from the intestine by the portal vein and returns to the liver, and only a small fraction reaches the general circulation and is excreted by the kidneys. In pneumonia the exudate in the lungs

contains much hæmoglobin, which is broken up in the body and excreted by the liver as bilirubin. Following this, there is an increased production of urobilin in the bowel, and consequently an increased absorption of it by the portal vein. The liver cells are thus doubly taxed—first, by the excess of hæmoglobin they must break up, second, by the excess of urobilin they have to excrete. If they are unequal to the task, more or less of the urobilin is not re-absorbed in the liver, but passes by the cells into the general circulation and is eliminated in the urine. In pneumonia there is often an acute parenchymatous hepatitis, which affects the functions of the liver cells. This is the explanation, then, of the fact of urobilinuria in pneumonia. Hildebrandt's paper contains a number of charts of pneumonia showing the relation of the urobilinuria to the temperature curve, and from these data it appears that:—At the beginning of a pneumonia urobilin is but slightly increased, even if the temperature is high. When the pneumonia is resolving the output of urobilin reaches its maximum. When resolution is complete the urobilin sinks to normal. Urobilinuria, therefore, is related to the resolution of the pneumonic process, and is caused by the relative inadequacy of the liver cells. When urobilinuria pursues the above course, sinking rapidly to normal after the lung has cleared, there is evidently no serious damage to the liver. If urobilinuria persists after resolution it is proof of parenchymatous hepatitis, which necessitates a more protracted convalescence, and may lead to chronic liver disease. In central pneumonia without physical signs the urobilin curve is of diagnostic value. For his methods of estimating urobilin Hildebrandt's other papers on the subject (referred to in this paper) should be consulted.

AUTO-SEROTHERAPY OF SERO-FIBRINOUS PLEURISY.

Gilbert was the first to inject a few cubic centimetres of the pleuritic exudate under the skin of the patient from whose chest it had been withdrawn, and his method of treatment has been successful in the hands of some French clinicians, while others have found it useless. Maillet, in a general review of the subject (*Gaz. des Hôpitaux*, 25th March 1911), finds that in 155 cases culled from the literature, 132 were completely successful. The method consists in withdrawing a few cubic centimetres of fluid from the pleura with a small syringe, and, without taking the needle altogether out, reinjecting the fluid under the skin of the thorax. The injections are repeated three or four times, at intervals of two or three days. The treatment has been used in all forms of pleurisy with effusion. The results of injecting are—(1) diuresis; (2) resorption of the effusion, taking place with unusual rapidity; (3) perspiration; (4) pyrexia. Acute pleurisies give the best results, but effusions of long standing have speedily disappeared after

a few injections. Three explanations of the beneficial action of these injections have been proposed—first, that the fluid sets up a specific defensive reaction; second, that the serum acts as a diuretic; third, that it is the withdrawal, not the reinjection, of the fluid which does good. Maillet's conclusion is, that as the treatment is not dangerous it should have a trial in all cases. He suggests that it would be advisable to withdraw a larger quantity of fluid (20 to 50 c.c.), and then to reinject 2 to 5 c.c., the object being to obtain the benefit both of aspiration and auto-serotherapy.

SURGERY.

By JAMES LOCHHEAD, M.D., F.R.C.S.

HÆMOSTASIS IN BRAIN OPERATIONS.

1. *Silver-Wire Clips as Ligatures*.—On the principle of Michel's clips silver-wire clips for the occlusion of deep vessels have been introduced by Cushing in operations on the brain and other parts of the body (*Annals of Surgery*, July 1911). Silver wire is rolled on a flat metal pencil with longitudinal grooves, and lightly tapped so as to form transverse ridges on the inner side of the loops. Deep median grooves on the pencil allow a pointed wire-cutter to snip the several loops of the same size. They are then loaded on a magazine and picked up one by one by means of holding forceps. These have an indentation on the inner face of each blade, in which the wire securely lies. The forceps are provided with a ratchet, the first catch of which locks the handles in such a position that they hold the compressible clip without crushing it. When the clip is pressed together on the bleeding point the handles unlock themselves.

The clips have been found useful for the occlusion of inaccessible vessels in the dura, the middle meningeal at the foramen spinosum, and vessels passing from the brain to a tumour. They are also recommended for other regions, *e.g.* the artery of the cystic duct, the inferior thyroid veins in the enucleation of an intra-thoracic goitre, and the bleeding points after tonsillectomy.

2. *Methods of Hemostasis in Brain Operations*.—In intra-cranial stasis, in which most of the venous blood returns by way of the emissary veins, hemorrhage from the scalp may be excessive. Cushing deprecates the use of artery forceps on the convex side of the flap, as their weight tends to tear the scalp from the bone, and the catching of the skin edge in clamps. It is usually possible to control the bleeding by a properly applied tourniquet round the head. It is inadvisable to try to ligate the vessels, as the skin sutures effectively control them. In the

skull all degrees of vascularity may be encountered. It is worst in superficial tumours, such as endothelioma of the dura, which discharge much of their blood through the diploe. The diploetic channels may be as large as the radial artery, and may be traced in radiographic plates. The only method of stopping hæmorrhage from these vessels and oozing from the roughened surface of the skull is by means of Horsley's wax. Arterial bleeding from the dura is not serious unless the middle meningeal is injured. When it channels the bone, separate the dura with prepared pledgets of gauze tucked under the bone till a point is reached where the vessel does not lie in a channel. The pressure of the pledgets against the tense dural surface controls the bleeding. Later, when the dura is opened, the vessel may be occluded with a silver-wire clip if it is inaccessible for ligation. Venous bleeding may be controlled temporarily by a pad of gauze wrung out of hot saline. Permanent control is more difficult, especially if the bleeding points are associated with Pacchionian granulations, and large clots may form after the operation is finished. Bits of living tissue, such as muscle, or of partly organised blood-clot, which is always obtainable if the operation is done in two stages, should be held against the bleeding point by smooth instruments. They adhere more promptly and check hæmorrhage better than gauze or wool, and they may be left in position. In the subtemporal decompression operation, with splitting of the temporal muscle in the direction of its fibres, some branches of the middle meningeal are likely to lie in the course of the radial incisions in the dura. There is little room for suturing them at the bottom of the wound, and they should be clamped with a delicate Halsted's clamp and occluded with clips. In the brain the usual methods of hæmostasis with clamp, gauze, and ligature may do great harm. Every effort should be made to avoid injury to the pia-arachnoid until the moment of entry to the subcortex, and the entry should be planned in accordance with the disposition of the cortical vessels. The great secret in avoiding injury is to lessen the tension—by pricking arachnoid spaces, by puncturing the ventricle or in the lumbar region, and by changes of posture. Much depends on the way in which the anæsthetic is taken. Before the cortex is incised some of the vessels may be secured by ligatures, but the large venæ anastomotice and important branches of the middle cerebral artery must be avoided lest outlying areas of softening and unexpected paralyses result. These vessels can often be pushed widely aside in the pia-arachnoid. In the enucleation of a tumour great patience must be exercised, the tissue being held in the left hand and freed by blunt dissection with the right. Vessels passing from the brain to the tumour are best treated by clips. The brain rapidly fills up the gap formerly occupied by a tumour, but the cavity may continue to ooze. Then fill the hole with a wad of dry absorbent cotton-wool, and

replace it as it becomes saturated. If the cavity is large, fill it with normal saline solution, and close the dura accurately.

3. *Two-stage Operations on the Brain.*—Cushing says: "Annoying though it is, it may improve one's score when in difficulties to play back with the loss of a stroke." It may be advisable to postpone the finish of the operation almost before it is begun owing to a badly taken anæsthetic. Cyanosis increases intra-cranial pressure by accelerating the secretion of cerebro-spinal fluid, which adds to the venous obstruction, and so to the loss of blood—a bad cycle. Though it is more difficult to administer, ether is safer than chloroform. There is less bleeding with the latter, but this is due to the lowering of arterial tension, and is comparable in its consequences to an actual loss of blood. Postponement is most often advisable at the stage when the bone flap is reflected and all bleeding from the dura is checked. It may be for hæmorrhage, and it should be borne in mind that "it takes nearly as long to get out of as it does to get into the intra-cranial chamber," hence the blood lost at this stage would be at the end multiplied by two. More particularly it may be advisable to stop should the membrane be so tense that cerebral protrusion is likely to occur through an immediate dural opening. A rapidly forming hernia often leaves irrecoverable paralyses.

The actual enucleation of a cerebral tumour at a second stage may be carried out without an anæsthetic. The brain tissue itself is insensitive, and, apart from hæmorrhage or injury to a vital centre, no "shock" occurs.

ALCOHOL INJECTION IN TRIFACIAL NEURALGIA.

F. C. Keller reports the results of alcohol injections in forty-eight cases of facial neuralgia (*New York Med. Journ.*, 1st July 1911). Of the patients, twenty-five were males and twenty-three females, and the ages ranged from 29 to 78. The duration of the disease prior to injection was from three months to forty-seven years. The third division was most frequently affected, sometimes alone, often with the second division, eight times with the first and second. While most of the injections were made without general anæsthesia, in the later instances nitrous oxide or ethyl chloride was administered. The period of relief following a successful injection varied from a few months to over two years. In a few cases no recurrence had so far taken place, but in the majority of instances neuralgia recurred and injection again afforded relief. Only five of the group experienced no relief after one or two injections, and in two the pain recurred within two months. A typical successful case may be quoted:—D. W. F., male, aged 59 years. First attack, 1889. Transzygomatic resection of second and third divisions, 1903, gave no relief. October 1910, injection for third division. Several paroxysms

six hours later, followed by complete relief for nine months. July 1910, injection for third division and into mental foramen; relief six months. February 1911, injection for third division; after several days of nagging pain, relief to the present time.

From a study of fifteen cases previously subjected to nerve resection Keller concludes that a successful injection or series of injections is followed by relief for about the same length of time as that following a first resection of a peripheral nerve. Reinjection for recurrence gives a longer period of relief than a repeated resection.

REMARKS ON GASTRIC AND DUODENAL ULCER.

From 1000 cases, in which at operation an indurated ulcer of the stomach or duodenum was actually demonstrated, W. J. Mayo draws several interesting and weighty conclusions (*Annals of Surgery*, September 1911). Two-thirds of the cases operated on during the last five years had their origin in the duodenum and one-third in the stomach. Only 3 per cent. were shown to have an ulcer in each viscus, and in all multiple ulcers were found in less than 5 per cent. of patients. Three-fourths of the operations were performed in males. All the ulcers, whether gastric or duodenal, situated within 2 ins. of the pylorus, the most frequent situation, gave a fairly definite clinical picture—pain coming on from one to three hours after meals, often in the night, and relieved by taking food, alkalies, etc. If obstruction was present, or if the disease existed in individuals in the later decades of life, the acidity might be normal or even below normal. Hypersecretion with acid eructations was more prominent and persistent than hyperacidity. Hæmorrhage was inconstant, and hæmatemesis was shown to be indicative of chronic ulcer only when it was preceded and followed by other symptoms of ulcer. The most important diagnostic sign was food retention, not necessarily the gross obstruction but the finer degrees of obstruction causing small particles of food to be found in the stomach eight, ten, and twelve hours after meals. Other things being equal, food retention was an indication for surgical interference. With regard to the treatment, whenever possible a chronic ulcer of the stomach was excised because of the liability to cancerous degeneration. The combination of gastro-jejunostomy and excision gave much better results than excision alone, probably because of the formation of adhesions at the site of the ulcer. Transverse resection of an hour-glass contraction, with circular end-to-end union, was better if combined with gastro-jejunostomy. Pyloroplasty was apt to be followed by crippling adhesions, and Finney's operation of gastro-duodenostomy gave much more satisfactory results. "The treatment of all duodenal and all obstructing ulcers of the pyloric end of the stomach by gastro-jejunostomy and excision or infolding the

ulcer is satisfactory, and gives 98 per cent. of cures or great improvement. Eighty-five per cent. of ulcers of the body of the stomach will either be cured or greatly relieved by excision (or devitalising suture compression) with gastro-jejunostomy." In no case was the condition worse after operation. The mortality of the surgical treatment was well under 2 per cent.

DISEASES OF CHILDREN.

By G. H. MELVILLE DUNLOP, M.D., F.R.C.P.,

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THE SERUM TREATMENT OF EPIDEMIC CEREBRO-SPINAL MENINGITIS.

FLEXNER and Jobling (*Journ. Amer. Med. Assoc.*, 22nd July 1911), on investigating the reports of the disease from many different sources, in Europe and America, previous to the introduction of the serum treatment, found that the mortality reached by the disease during the height of the epidemics approximated to 75 per cent. In the sporadic form the mortality has seldom been below 75 per cent., and sometimes considerably higher. Flexner has subjected to analysis 712 cases of bacteriologically proved cases of epidemic meningitis in which the serum has been employed. This series of cases included all ages and periods of life, from infants a few weeks old to adults of advanced years.

Of the 712 cases treated 488 patients recovered and 224 died, giving a gross mortality of 31·4 per cent. If we consider the important age groups as they are known to affect the mortality we shall find that among children from 1 to 2 years of age, of whom 104 were included in the tabulation, the mortality was 42·3 per cent. This figure represents an obviously great reduction, since epidemic meningitis amongst infants of such tender age has terminated fatally in the past almost invariably.

There were 326 cases in the age group between 2 and 15 years where the mortality was 23·4 per cent. After the fifteenth year the mortality as represented by the tabulation rises and exceeds 30 per cent.

Another factor considered in this analysis was the period of the disease at which the serum treatment was begun. Analysed in this way it was found that 180 patients were injected with the serum within the first three days of illness, among whom the mortality was 25·3 per cent. In the second period, which extended from the fourth to the seventh day of the illness, 179 patients were injected in whom the gross mortality was 27·8 per cent. Of 129 patients injected later than the seventh day of the illness the mortality rose to 42·1 per cent.

These total figures indicate unmistakably that early serum injections are more effective than the later ones, which fact has an important bearing on our conclusions concerning the value of the serum. Moreover, if we should pick out one or two specially striking examples from the tabulations, the results become even more impressive. For example, 17 children ranging in age from a few weeks to 2 years were injected with the serum in the first three days of illness of whom only a single child died and 16 recovered. This result is altogether extraordinary when it is remembered that at this period of life the usual mortality of the disease approaches 100 per cent. The favourable effects of the serum are further disclosed in respect to the effects produced on the symptoms, course, duration, and manner of termination of the disease. The favourable influence of the serum on the general condition and symptoms of the patient is a most impressive immediate phenomenon. It often happens that within 24 hours there is a permanent return to consciousness, disappearance of delirium, and relief of headache and vomiting. The effects that are slowest to yield are the rigidity of the neck and Kernig's sign, which often persist even for some time after the child is running about. We find that the influence of the serum coincides with the effects exerted on the local inflammatory exudate and the viability of the meningococci. In all but a few resistant cases the diplococci are quickly reduced in number, rendered incapable of multiplication, and the inflammatory process is arrested and brought to rapid resolution. The average duration of cases going on to recovery before the serum treatment was introduced was, according to Holt, five weeks or longer in 50 per cent., whereas in 288 serum-treated cases recorded by Flexner and Jobling the active symptoms disappeared on an average eleven days after the first injection. The action of the serum on the manner of termination of the disease is also striking. Epidemic meningitis rarely terminates by crisis. Recovery, when it occurs, tends to be gradual or by lysis, whereas in serum-treated cases a very considerable number terminate by crisis. Flexner further points out how infrequently permanent effects such as deafness, blindness, idiocy, or paralysis result when patients are treated by the serum.

SPECIFIC MICRO-ORGANISM OF SCARLET FEVER.

Up to the present time the causation of scarlet fever has remained undiscovered, and all efforts to obtain the specific organism from the blood, throat cultures, and skin have been disappointing. A. G. Vipond (*Arch. of Pediatrics*, July 1911) came to the conclusion that the discovery of the cause of the enlargement of the lymph glands in scarlatina would at the same time unearth the specific organism of scarlet fever, probably in the form of a bacillus, inasmuch as diphtheria, which so closely resembles scarlatina, has a bacillus as specific organism. Con-

fining his attention entirely to the glandular system in severe cases of scarlet fever, lymph was extracted from enlarged glands in different parts of the body and inoculated in various media. In every case within a few hours a mixed growth developed, part of which proved to be staphylococcus aureus and part, a raised white growth, which turned out to be bacilli. The bacillus, when isolated, proved to be of rapid growth, and grew readily on all the different media, the growth occurring in three and a half hours, thus proving itself to be a rapidly growing bacillus. The bacilli are found in the lymph glands, where they multiply and form toxins which enter the circulation. Having obtained the bacillus which he regards as the specific organism of scarlet fever, the author's next step was the inoculation of animals. Accordingly bacilli were inoculated into five monkeys and two rabbits. Typical scarlet fever developed in all, showing a rash, sore throat, enlarged glands, and desquamation. No suppuration took place in any case at the point of inoculation which streptococci would probably have caused. The shortest incubation period was two days. The cultures show a growth produced by long bacilli with rounded ends, staining with Gram and occasionally showing a beaded structure, but metachromatic granules are not present. Some cultures show sluggish oscillatory motility. The organism is an active spore former, the spores being the same diameter as the organism.

The same bacilli have been recovered from the lymph nodes in each instance, and, further, the typical growth has developed in the different media.

RUMPEL AND LEEDES PHENOMENON IN SCARLET FEVER.

The authors describe petechial hemorrhages from artificial stasis, which ought to prove of considerable help in the diagnosis of scarlet fever (*Munch. med. Wochenschr.*, 1911, lviii. 293). During an epidemic, when making blood examinations, they noticed that hemorrhages in the skin appeared on the distal side of the bandage used for compression. This phenomenon appeared almost without exception in several hundreds of cases of scarlet fever, the most typical lesions being found about the elbow. The small pin-head hemorrhages disappeared quickly, but the larger ones remained for several days. This phenomenon appears fairly early in the disease, occurring sometimes before the eruption. The susceptibility to its occurrence diminishes as convalescence goes on, the reaction failing in large numbers of cases to take place after the twenty-first day. The reaction failed to take place only once in a typical case of scarlet fever, and this was possibly due to an excess of subcutaneous fat. To make the test a rubber band is placed round the upper arm, causing venous congestion and not occluding the arterial pulse. In fifteen minutes the bandage is

loosened and the tender skin at the elbow is put on the stretch and examined, when a number of small dark petechial hæmorrhages are found to have developed.

The reaction depends on the resistance of the capillaries, which in scarlet fever is much impaired by the toxins of the disease. In doubtful cases in children where the throat signs were suspicious a positive result was always confirmed by the development of a scarlatinal rash.

In other conditions it is quite exceptional to get a result similar to this lesion, but in measles occasionally petechial hæmorrhages are found.

BABINSKI'S SIGN IN DIPHTHERIA.

Rolleston (*Review of Neurology and Psychiatry*) discusses the question of the presence of Babinski's sign in diphtheria and arrives at the following conclusions:—(1) Babinski's sign is found in a considerable percentage of all cases of diphtheria, the character of the response being rapid, deliberate, or intermediate in character; (2) the extensor response in this disease is not confined to infants, but may be obtained, though with decreasing frequency and duration, especially after the eighth year, until adult life; (3) it is essentially a phenomenon of the acute stage, in most cases being replaced by flexion during convalescence. Transition stages often exist in which various forms of response may be obtained; (4) the sign is not pathognomonic of diphtheria, since it occurs in other acute infections such as scarlet fever, typhoid, lobar pneumonia, etc., but it has a certain diagnostic value, since it is met with more frequently than in non-diphtheritic angina; (5) it is more frequent and persistent in severe than in mild attacks of the disease, and its presence has therefore a certain prognostic value; (6) it is not associated with any special condition of the tendon jerks, and is never accompanied by ankle clonus; and (7) it is probably due to a transitory perturbation of the pyramidal system by the circulating toxins, comparable to the slight degree of meningeal reaction which is a frequent occurrence in acute infections.

DISEASES OF THE EYE.

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PEMPHIGUS OF THE CONJUNCTIVA.

THIS disease, though known to occur, is decidedly a rare condition. It is apt to lead to essential shrinking of the conjunctiva, so complete at times that in the end there is absolutely no *cul-de-sac*, the conjunctiva simply passing from near the margin of the cornea to the edge of the

lids. So apt is this to be the case that the reasoning is sometimes reversed, and a patient with "essential shrinking" is assumed to have suffered from pemphigus. The case reported by Bouchart presents points of interest more important than its mere rarity. In April 1910 he first saw the patient, a woman of 33, who was just recovering from a singular and severe attack of illness in which all the mucous surfaces, buccal, pharyngeal, and vaginal, exhibited copious formation of confluent vesicles. In some places the skin also suffered from a similar eruption, notably the face, scalp, hands, and feet. Then the eyes became affected, and in spite of immediate and careful treatment adhesions between lid and globe began to develop immediately, which resisted all efforts to prevent their formation. The patient next had intense photophobia and spasmodic closure of the eyelids. On forcible opening of the eyelids the conjunctiva was found to be oedematous but not soft, rather, indeed, firm and hard. On the lids were numerous small rounded ulcers, brilliant red in colour, tending to run into one another; the borders of these were elevated and a fine pellicle covered them; the cornea also showed a few superficial ulcers. As the acute condition passed off the patient's appearance became most distressing, covered with scars all over hands and limbs, with the nails nearly destroyed. By means of long-continued massage with an ointment of one of the organic compounds of silver, by internal use of organic arsenic, and strychnine, Bouchart succeeded in obtaining a great deal of improvement, but there still remained much scarring of the lids, with dry and scanty conjunctiva. The special interest in the case as recorded was the fact that the condition had been seen at the very beginning and was under observation all the time. This very rarely happens. The cases are apt to be brought to the surgeon only when far advanced, with the original erosion or ulcer gone and the shrinking and atrophy far advanced.

SPASM OF THE RETINAL ARTERIES.

Cases occur from time to time which used invariably to be attributed to embolism of the central retinal artery—cases in which a patient, sometimes quite a young and apparently healthy person, suddenly and permanently lost sight in one eye. In such cases, as a rule, the whole central portion of the field of vision was blotted out, and all that remained was a small area of the periphery of the temporal half. The diagnosis was arrived at really for want of any better explanation, and on account of the interpretation—perhaps an erroneous interpretation—of the ophthalmoscopic changes, but it carried the grave objection that it did not take account sufficiently of two important circumstances, namely, that the heart did not exhibit any indication which could point to a source of embolism, and that the patient in a

certain proportion of the cases could give an account of previous, but abortive, attacks of the same nature.

These cases have a further point of interest too, that they may help to throw some light upon the pathology of migraine and of transitory hemianopsia, with which they are sometimes complicated. It has been suggested that some of them are due to spasm of the retinal arteries, an interesting example of which, though differing slightly from the cases of the class to which we have made reference, yet bears upon this matter. It is published by Bruns of New Orleans, U.S.A., and deals with the case of a girl who complained that for two weeks vision had been failing. The only point of importance in her history was that she had had a "convulsion" three weeks previously. To all appearance the girl was in sound health, though a little delicate; but vision was reduced to counting fingers with the right and left eye at four feet and fifteen feet respectively. The arteries in the fundus were very narrow; the veins enlarged and dark; there was a bluish-white œdematous halo round the discs, which were pale. A medical colleague attributed the condition to a neurosis, perhaps set up by intestinal toxins, there being no arterio-sclerosis, and evidently considered her neurotic if not hysterical. Yet the fields, as vision improved (to $\frac{6}{6}$ and $\frac{6}{6}$), became normal, and never at any time suggested hysteria.

That there is such a condition as genuine spasm of the retinal vessels seems from the cases published from time to time quite certain, but the occurrence must always raise in one's mind the possibility of early arterio-sclerosis, for it appears to be true that such spasm more readily occurs in arteries whose walls are beginning to undergo this change. In this particular instance the examining physicians were unable to detect any evidence of this, but for a time the girl had a trace of albumin in the urine. Nor did they find any stigmata of hysteria. Her symptoms appear to have ceased with the onset of menstruation.

GRAVE AFFECTIONS FOLLOWING TRIVIAL INJURY.

As in other parts of the body so in the eye some grave disease may follow a trifling injury, a disease which we know to occur frequently without any suggestion of injury. This matter becomes very serious when questions of liability and compensation are involved in the issue also. To give two examples: A miner receives a foreign body on the cornea and immediately nystagmus develops. Or a man receives a slight blow on one eye, and interstitial keratitis first in that eye then in the other makes its appearance in a few weeks. An example of the latter occurrence was recently recorded by Hennart of Lille: A boy of 14 received a very slight injury to the cornea of the left eye. Within a few days interstitial keratitis began, and spread rapidly; in another

fortnight the other eye became similarly affected. Now this boy presented no signs—certainly no unequivocal signs—of hereditary syphilis. On the ground that the association might either be a fortuitous occurrence or that the keratitis might have been about to develop at any rate, the claimant was awarded no compensation by the judges. Commenting on this decision, Grandclément very justly—as it seems to me—expresses disapproval, and considers that the attending surgeons gave unwise advice to the judge.

Another case recorded by Grandclément was a somewhat curious one. To the station-master at his terminus the driver of a train complained of suffering from colic. This was treated by the official surgeon of the line, and it was only some days later that he complained that the eye was bad, and that on the day on which he first complained of being ill he had had that eye and his face badly scorched. He had never till then mentioned the fact. The eye was practically lost by septic ulcer of cornea, and very unfortunately his other eye became similarly affected about five months afterwards and was likewise lost. When the compensation question came on for trial he was awarded substantial damages. The weak point in his case was that neither on receipt of the injury, nor when he complained of colic to the station-master, nor even when under treatment by the surgeon to the line, did he say anything about his eye; it was only when this last noticed the condition of his cornea and questioned him about it that he admitted that the eye had been injured by the spurt of flame. It was really only because there was no other way of accounting for the attack of keratitis in the originally injured eye that he was awarded damages. As regards the second eye the case was even more “thin,” but the Court awarded further damages in view of the state of this eye. It is doubtful whether a British jury would have been so docile towards the medical witnesses.

REFERENCES.—*L'Ophthalmologie Provinciale*, May 1911. *Ophthalmology*, vii. 2. *L'Ophthalmologie Provinciale*, viii. 2.

DERMATOLOGY.

By W. ALLAN JAMIESON, M.D., F.R.C.P.,

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and

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POST-PSORIASIC LEUCODERMA.

As a result of the disappearance of the papules or patches of psoriasis one sometimes finds, where the eruption had been, pigmented or hyper-

chromic stains, which are usually ascribable to the medicinal agents employed in the cure. Much more rarely, according to Petrini (*Ann. de Dermat. et de Syph.*, March 1911, Paris), a more or less extensive leucoderma is encountered. Petrini relates three cases, and the illustrations which accompany these are convincing that he is dealing with a real post-psoriatic achromia and not a mere accidental association with leucoderma, for in places the psoriasis is still perpetuated in the form of a marginal line bordering the dead white achromic space. In addition there is no neighbouring zone of hyperpigmentation, so frequently met with in simple leucoderma and noticeable also in the syphilitic variety. There is an actual substitution of achromic macules for the red and scaly patches of psoriasis. The favourite local treatment employed by Petrini is the application, after a bath, of an ointment composed of equal parts of oil of cade, powdered talc, and vaseline, covered with a soft flannel bandage. His experience is that under this method of treatment the scales are soon detached and the red patches of psoriasis slowly vanish. As to the cause of the blanching he submits the following hypothesis:—"That the lesions of psoriasis are capable, in certain cases and persons, of occasioning a disturbance of the pigmentation of the Malpighian layer of the skin, so that achromic areas replace the fading patches of psoriasis." As to the duration of the blanching he has nothing personal to contribute, since his cases were not seen again, but in an instance of Rille's it had lasted two years. In one of Kaufmann's the contour was less distinct after a lapse of a year and a half. The important practical point is to differentiate these from leucoderma syphiliticum.

SPOROTRICHOSIS FROM THE HORSE.

The numerous instances of sporotrichosis which have been met with during the last five years are evidence that it is by no means so rare as was at first supposed. Sutton (*Bost. Med. and Surg. Journ.*, 9th February 1911) regards it as fairly prevalent in the United States, particularly in the middle west, yet it is frequently not recognised because the medical attendant is not familiar with its clinical manifestations.

Usually an incorrect diagnosis of syphilis, tuberculosis, or coccic cellulitis is made. Nevertheless a traumatic lesion of the arm, forearm, or leg, which proves resistant to ordinary surgical treatment, and is accompanied by the development of one or more sharply circumscribed painless cutaneous or subcutaneous abscesses along the course of a limb, should always arouse suspicion, especially if the inflammatory manifestations typical of a streptococcic cellulitis are absent. To recover the causative agent, a few drops of the tenacious chocolate-

coloured fluid contained in the abscess cavity should be removed by aspiration and the fungus cultivated on artificial media. It is strictly aerobic, and abundant growths can easily be secured on practically all ordinary culture media, particularly those which are slightly acid. Of late, a number of instances of sporotrichal infection in horses have been studied, and an example in man under Sutton's care seems to have originated from equine contagion. The patient was a farmer, aged 44, whose health was excellent. In November 1909 one of his horses was cut by barbed wire on the left shoulder. The wound healed slowly, but six weeks after the injury several hard lumps about the size of beans appeared beneath or in the skin of the neck. These were seemingly painless. They softened and one broke, exuding small amounts of thick tenacious brownish pus. The others became absorbed, but the wound on the shoulder and the ulcer of the neck were not completely healed till June 1910. In May 1910, while repairing a manger with wire, the patient sustained a punctured wound of the right wrist. On this a firm, flat-topped, painless, reddish papule formed and grew larger. This was incised, drained, and cauterised with carbolic acid, yet still it augmented in size. Next, small subcutaneous nodules arose on the flexor aspects of the fore and upper arm, without evidence of acute inflammation. The brownish syrupy pus from four of the abscesses resulting from the softening down of these nodules was inoculated on agar and the characteristic mycelium of *sporothrix Schenkii* grew freely. Under increasing doses of iodide of potassium with local compresses of 1 per cent. liq. cresol comp. he made a rapid recovery. The weak point is that no cultures were made from the abscess on the horse.

CEMENT PASTE.

Dreuw observes (*Monatshefte f. Prakt. Dermat.*, 1st February 1911) that Unna, as a result of numerous investigations into the desiccative property of pastes, discovered that this was notably increased by the addition of terra-silicea. His formula for his zinc paste runs thus: R. Zinci oxidi, 10·0; Terræ siliceæ, 2·0; Adipis benzoat, 28·0 M. This paste has undoubtedly the advantage over that of Lassar—R. Zinci oxidi, Amyli, Vaselinei, Lanolini, aa 25·0 M.—of having a greater power of capillary attraction and capacity for drying—peculiarities which arise from the porosity of the microscopically fine coating of terra-silicea. Dreuw draws attention to a paste suggested by him which displays properties not possessed either by that of Unna or of Lassar. This, twenty-four hours after its application, forms a closely adherent coating of the colour of cement, which in its action and effects resembles zinc-ichthyol gelatine, though somewhat weaker. It

even, when dry, exerts a slightly compressive influence. Its composition is as follows:—R. Sulphuris depurat, 10·0; Ichthyoli, 5-10·0; Pasta Lassar, ad 100·0 M. Its action is this—(1) It has, so to speak, a super-paste consistence, and therefore strongly desiccative properties. (2) In twenty-four hours or less after its application the effect of this combination is distinguished from that of Uma or Lassar in so far that it dries into a grey, firm, porous layer of a cement-like aspect, and produces a grey coating on the skin. This coating is firmly attached to the skin, and frequently, for instance on the shin, can only be removed by long softening or by the use of benzine. It is applicable to all weeping skin diseases, as eczema of the legs, ulcers of the legs, weeping trade eczemas, pemphigus, &c. Secretion lessens, inflammation disappears, pain ceases, and in quite a number of ailments difficult to treat it brings the symptoms rapidly to an end. It is easy to add to it other and more strongly reducing substances as tar, pyrogallol, or anthrasol.

ETIOLOGY OF LUPUS ERYTHEMATOSUS, WITH ESPECIAL REFERENCE TO TUBERCULOSIS.

Friedlander of San Francisco (*Journ. Cut. Dis.*, New York, August 1911) has investigated into the theories of causation, which he states are the following:—(1) The lesion is due to tubercle bacilli *in situ*. (2) It is due to a toxin developed by a tuberculous focus elsewhere in the body. (3) It is due to a toxin not of tuberculous origin.

Practically the entire French school favours a connection with tuberculosis, while the English, German, and Austrian schools are opposed to this idea. The conclusions he arrives at are: That the disease is not tuberculous *per se* is evident, but the question as to whether it is due to a tuberculous or other toxin is not so clear. Probably the truth lies somewhere between the two extremes, that is to say, that the disease is caused by a toxin, carried by the blood, as evidenced by the fact that the blood-vessels are the first structures to be affected, and while tuberculosis or a tuberculous inheritance may predispose to lupus erythematosus by lowering the general resistance, it is certainly more of a predisposing than a causative factor.

That it is a constitutional affection is clearly shown in those cases which pass over into the acute fulminating type, where the patient shows all the symptoms of a profound toxæmia, with involvement of various internal organs, especially the kidneys, but the cause of the toxæmia cannot be laid on any single toxin. That feeble or deranged circulation, trauma, and irritation are factors in the causation of this affection is also evident, but whether the toxæmia precedes the local irritation and the external lesions and is the exciting factor, or whether

the skin, deranged by the external lesion, presents less resistance than the remaining cutaneous envelope to the irritating factor, is a question to be determined.

THE PATHOLOGICAL ANATOMY AND PATHOGENY OF ACNE KELOID OF THE NAPE OF THE NECK.

Acne keloid of the nape of the neck, though not frequently encountered, is not very rare. In its simplest form it constitutes a local annoyance, when more pronounced, and should the stage of true tumours be reached, it represents a painful deformity and interferes with the movements of the part. Its treatment has been entirely transformed since the introduction of radiotherapy, and by timely intervention this procedure is followed by almost certain cure. But its pathology and pathogeny are still obscure, and Pautrier and Gouin (*Ann. de Dermat. et de Syph.*, Paris, April 1911) have done good service in instituting a minute survey into these points. There are many interesting questions in connection with it which await solution. One of these is: Can acne keloid appear elsewhere than on the neck? The preliminary stage consists in the occurrence on the nape of the neck, near or actually among the hairs, of pustular or furuncular lesions, and between these active elements there develop whitish fibrous elevations, residual cicatrices of previous pustules. This process lasts several years, and then one or two cushion-like projections, keloidal in aspect, stretch across the neck behind, the lower margin of these fading gradually into sound skin, the upper, more abrupt in its character, showing still infected points, which contain groups of hairs deeply embedded in the keloid tissue. There is yet diseased activity in progress, but this eventually ceases, and there is now visible a prominent pad of a rosy red hue, cicatricial in appearance, and having a smooth and pearly surface. True keloid of the front of the chest sometimes succeeds acne of that region, but here on the chest the acne seems to be the starting-point of an invading tumour with an independent course, while in acne keloid of the neck it always follows step by step the pustulation which invariably precedes it. The histology, too, differs. That on the chest is a true keloid, while acne keloid of the neck has special features. This view is supported by a case where acne in the submaxillary region was eventually followed by lesions indistinguishable from acne keloid of the neck. The margin of a progressive acne keloid of the neck exhibits in the epidermis evidences of parakeratosis, while in the corium there are layers of infiltration mainly composed of plasma cells. In the neighbourhood of the hair follicles the sebaceous glands are profoundly altered, their cells being replaced by giant cells. There is almost entire disappearance of

elastic tissue. This reminds one somewhat of a tubercular lesion, but it must be borne in mind that the value of the giant cell in relation to tuberculosis has lost nearly all its value. Apart from a few yellow and white staphylococci, no micro-organisms were discovered, yet the observers are most strongly inclined to regard acne keloid of the neck as a skin disease of infective origin.

OCCUPATION ERUPTIONS AFFECTING SPECIALLY THE HANDS AND ARMS.

Jacquet and Jourdanet (*Ann. de Dermat. et de Syph.*, Paris, January 1911), while admitting the influence of external irritation in evoking this class of eruptions, are disposed to regard it as vague. Hebra and Kaposi held, as the primary predisposing cause, an individual irritability of the skin. Thibierge, while accepting this, placed in the first rank digestive disturbances, a point to be carefully considered in treatment, since their frequency is incontestable. Out of twenty-seven cases of eruptions of the hands and arms, more or less connected with occupation, noted by these observers, in no fewer than twenty-two were there grave faults of digestive hygiene present. Thus some were alcoholic or addicted to the excessive use of coffee, others were fond of condiments, some ate in excess, while no fewer than eighteen of the twenty-two ate too quickly. Many had defective or decayed teeth. In the general treatment of these cases the following rules were laid down:—(1) To eat with extreme slowness; three-quarters of an hour at each meal should be devoted to the careful mastication of all food, even the most tender. (2) To abstain from all condiments except salt. (3) To drink at the most one to two glasses of water; if to this wine be added, then very little. (4) To refrain from fish, shell-fish, and pork, though ham is permissible. (5) No alcohol or undiluted wine, beer, liqueurs, or appetisers of any description. The rules are simple but not easy to put in practice. In respect to mastication in particular, it is necessary to break off old habits, always a very difficult matter. Slow eating is to be placed at the head as of the highest importance. One should advise the patient not to read while eating, to have his watch before him, and from time to time to ascertain that the advice has not only been understood but followed. The results were quite extraordinary. Of the twenty-seven patients all except two were greatly improved or cured in from three to seventeen days (a mean of six to eight days) by observing the regimen given above, combined with abstention from the occupation. Analysed, it is seen that quick eating increases the functional toil of the stomach in several directions. It heightens its sensitiveness and its temperature, necessitates more frequent and energetic contractions, retards the evacuation of its contents towards the small intestine and so subjecting the stomach

to over-work. Slow eating acts in exactly a contrary fashion. It gives the maximum of result with the minimum of effort. Rapid eating alone exercises in occupation eruptions a harmful effect in proportion to its degree, and inversely, slow eating exercises a curative effect in proportion to its perfection. The commencement of occupation eruptions may be evidenced by pruritus (hyperæsthesia of the cutaneous terminations of the great sympathetic nerves) or by dermalgia (hyperæsthesia of the ends of nerves of cerebro-spinal origin). To this first phase succeeds more or less rapidly erythema, significant of vascular paralysis of sympathetic origin, and then processes of vesiculation and eezematisation, the origin of which, in so far as it relates to the influence of the nerve terminals, is less obvious. In proof of this it is sometimes possible to surprise the irritation in transit. We may find an increased sensitiveness to pressure of the cervical portion of the pneumogastric, or of the nerves of the arm where accessible, notably in the axilla. One may formulate a law thus - "The conflict or the convergence of external irritation with one or more internal irritations increases, even to the limit of exhaustion, all cellular reactivity, and disturbs and deranges it." This, through the fact of exposure, is determined to the hands and arms. It is not contended that the irritation of gastric origin is always the sole cause. Irritation from other sources may complicate it, and the authors cite that for instance starting from dental foci, as well as that arising from cerebral or cerebro-spinal centres, or from the ovaries or uterus.

PUBLIC HEALTH.

By WILLIAM ROBERTSON, M.D., D.P.H., M.O.H., Leith.

THE PRESENT-DAY ADMINISTRATIVE ASPECT OF TUBERCULOSIS.

As years roll on the medical officer of health finds himself coming into closer grips with pulmonary tuberculosis, and there are now few local authorities that are not alive to the need for encouraging their sanitary adviser in his efforts to deal effectually with the disease.

Doubt was cast upon the advisability of coupling tuberculosis with other acute infections. It was universally agreed that infection could be spread by the dissemination of the tubercle bacillus, but hesitation was expressed regarding the system of notification that would meet the case. Experience of compulsory notification has not by any means cleared away the doubts that existed, since notification is not practised in the way that it is when, say, scarlet fever, diphtheria, etc., come under the notice of the practising physician. In one district where

compulsory notification of tuberculosis has been adopted the practitioners are in the habit of notifying cases after the death and burial of the patient.

One can picture the state of mind of the medical officer of health if the same principle were applied to typhus, smallpox, or other acute infections!

Compulsory notification has come to stay. It is needless, therefore, to bandy words over the matter. Every effort ought to be exerted to make the principle and aim of notification a success. But notification is only one of the preliminary steps in coping with the disease. Education of the patient, treatment, and disinfection require consideration.

By means of a competent staff systematic house-to-house visitation can do much to impress upon the citizen the absolute need of good ventilation, cleanliness, and sane methods of living. At the sanatorium, which every local authority should now possess, treatment may be begun and education perfected.

Disinfection must, in many instances, be of a radical nature, because the infected premises and bedding are, literally speaking, past redemption. True, a fictitious value is often placed upon articles that are only fit for destruction, but agreement can usually be arrived at before the stage of burning is reached.

In a few years there will be few districts that have not provided accommodation for the treatment of early and perhaps the isolation of advanced cases. The responsibility is there, and it must be faced. This altogether apart from the question of State aid.

If one were to offer a decided opinion it would be to say that the big stick of the State ought to be applied to the back of every local authority that did not institute an active crusade against damp, ill-lit, badly ventilated, and otherwise insanitary houses. Such an impetus is more urgently wanted than money for sanatoria. It is quite easy to build and equip open-air shelters, but one desires to see them unoccupied. The reduction in the number of applicants for admission can only be effected by a riddance of slums and the substitution of sanitary dwellings. The task is not insuperable.

If the medical officer of health is a man of courage he need have no fear of interested property owners. Fixity of tenure protects the health official, such fixity being by no means assured to the slum owner when he becomes a member of a local authority. Public opinion and the confidence that he is doing the right thing are always behind the actions of the medical officer of health.

The sanatorium is at present a necessity. It is, however, the *Omega* of the whole problem. The *Alpha* is the dwelling of the patient.

It was expected that the Housing and Town Planning Act would pave the way for the sweeping away of insanitary dwellings. It is a

good Act in many respects, but it has not been framed to suit Scottish conditions of housing.

In three respects it is an improvement upon the Housing of the Working Classes Acts.

Firstly, an aggrieved person now appeals to the Local Government Board: formerly the appeal was to a sheriff. But the machinery to be set in motion, through the agency of notices, is very laborious and technical. Secondly, the new Act enables a local authority to order *Demolition* of an insanitary house after the expiry of a stated period; under the old system one got no further than a *Closing Order*. Unfortunately, under the Housing and Town Planning Act a property is not dealt with as a whole. It is in this respect where Scottish conditions have not been met. Here is a case in point. A tenement consisting of fourteen separate dwellings is under review. Ten of these dwellings are quite unfit for human habitation; the other four cannot be so classed because they are well lighted and ventilated and of fairly good construction. The ten houses are condemned and a *Closing Order* with its multitudinous notices issued. What is to be done with the four sanitary houses when a *Demolition Order* is sent out against the aforesaid ten houses? If the latter are pulled down the four will be insecure, and no one has a right to call them insanitary until they become dangerous to health by reason of the surrounding conditions.

In the Act the word "tenement" refers to every individual house. In Scotland the word conveys to the average mind a totally different meaning. That is a digression, but it is purposely made to indicate that we have not yet reached the most simple method for dealing effectively with insanitary tenements, as we in Scotland understand them, *en bloc*.

In Glasgow and in Leith last year an effort was made to close several such properties with an ultimate view to their demolition, but the Courts ruled both authorities out of order because *each* dwelling had not been dealt with on its merits.

Thirdly, the Act gives local authorities powers to put into effect town planning schemes. This point need not be laboured at present. It is sufficient to know that under this section of the Act big reforms may be put into effect by creating garden cities and opening up congested districts with new roads and thoroughfares on definite and expansive lines.

In the course of the next decade one may expect to find such a township planned on modern lines, withavenued streets and single or double storeyed houses, at Rosyth.

The Scottish tenement system is by no means a desirable one, but it will be long before the builder and speculator can be persuaded against its continuance.

To come back to the administrative control of pulmonary tuberculosis, it is gratifying to know that in Glasgow and Dundee the

respective local authorities have instituted dispensaries at which advice and treatment may be given. At Dundee tuberculin in increasing doses is being tried. Other local authorities will doubtless follow suit.

To be of the best value the dispensary ought to be under the supervision of the medical officer of health. The disease being dealt with is notifiable, and that being so cannot now be dissociated, as far as administrative action goes, from the other infections named in the Notification Act.

This brings one to the question of what one might term specific treatment. Dr. Camac Wilkinson has for many years held very advanced ideas on this question; in fact he has gone so far as to declare in favour of tuberculin dispensaries rather than sanatorium treatment. In fairness to him, however, it must be said he advocates such dispensaries for the treatment of early cases.

It may be that the English citizen is more alive to the necessity for early appeal to treatment. It is assuredly not so in Scotland. We rarely have submitted to us cases that can be labelled "early." During the past ten years in Leith, where systematic treatment of pulmonary tuberculosis has been carried on, the percentage of early cases seeking treatment has been small. When such cases do present themselves we, literally speaking, welcome them with open arms. As far as our experience goes we cannot bring ourselves into line with Dr. Wilkinson in his declaration in favour of exclusive home treatment with tuberculin. We have tried it against sanatorium plus tuberculin, with results that proved the undoubted superiority of the latter course.

For over a year we have worked carefully with tuberculin on the lines laid down by many continental authorities and so strongly advocated by Dr. Camac Wilkinson. In not a few instances the results have been astonishingly good, infinitely better, without a doubt, than when dependence was placed merely on fresh air, good food, and rest.

Tuberculin was tried in small doses for prolonged periods. Here again the results were not much better than among those who were undergoing the ordinary out-door régime without specific treatment.

We did not concern ourselves with controversial or theoretical considerations, but made up our minds to discover the best system, as demonstrated by the progress of our patients. As far as our judgment goes we could come to no other conclusion than that tuberculin given in increasing doses can and does produce excellent results; the physical and clinical condition of several of our patients proved it. At another time we hope to give a year's experiences with tuberculin. The treatment is not one that is to be lightly undertaken. It calls for great care and discrimination. In fact in the hands of those who are either sceptical or unwilling to persevere its utility may be readily questioned.

One patient may show no improvement whatever under one preparation of tuberculin, but with the exhibition of another variety improvement begins immediately to manifest itself. Also some patients may be tried with all manner of brands of tuberculin, and will give the medical man no encouragement to persevere.

All this emphasises the need there is only to undertake tuberculin treatment if one means to persevere.

It is certainly true to say that in the treatment of pulmonary tuberculosis no one can overlook the value of tuberculin. In fact in tuberculin the health official has had placed in his hands a powerful weapon not only for diagnosis but also for treatment; and that treatment is more or less specific.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

AT a meeting of the College, held on the 18th instant, the following gentlemen, having passed the requisite examinations, were elected Fellows:—

E. W. C. Bradfield, L.S.A.(Lond.), M.B., Ch.B., Capt. I.M.S. ; H. P. Cook, M.B., Ch.B., Capt. I.M.S., Edinburgh ; F. A. F. Corbett, M.D., C.M., Nova Scotia ; C. F. Cuthbert, L.S.A.(Lond.), M.R.C.S.(Eng.), Gloucester ; L. J. M. Deas, M.B., Ch.B., Capt. I.M.S., Edinburgh ; J. E. Dewar, M.D., C.M., L.R.C.P.(Lond.), M.R.C.S.(Eng.), Minnesota, U.S.A. ; A. N. Fleming, M.B., C.M., Major, I.M.S., London ; R. M. Glover, M.B., Ch.B., Edinburgh ; S. C. S. Gupta, M.B., Ch.B., Edinburgh ; S. M. Livesey, M.B., Ch.B., Straits Settlements ; H. G. Murray, M.D., C.M., M.C.P.&S., Ontario, Canada ; R. E. Powell, M.D., C.M., St. John, N.B., Canada ; S. N. Ray, M.B., Calcutta, India ; C. H. Reinhold, M.R.C.S.(Eng.), L.R.C.P.(Lond.), Capt. I.M.S., London ; C. M. Schaffter, M.B., Ch.B., Ispahan, Persia ; J. Strathearn, M.D., M.B., Ch.B., Glasgow ; R. Verel, M.B., Ch.B., St. Cyrus, N.B. ; and J. I. P. Wilson, M.D., M.B., Ch.B., London, N.W.

NEW BOOKS AND NEW EDITIONS.

The Disorders of Postnatal Growth and Development. By HASTINGS GILFORD, F.R.C.S. Pp. 727. Illustrations, 65. London: Adlard & Son, Bartholomew Press, Bartholomew Close, E.C. 1911. Price 15s. net.

THIS is a thoughtful and also a thought-provoking book, full of interest for the man who tries to look through the details of ordinary professional experience into the great principles which underlie them, into the determining factors in causation, and into the laws which govern the apparently haphazard choice of the effective cause. It is, moreover, an entirely readable book, an excellent thing in books, and grateful to the jaded reviewer of many text-books, with their somewhat monotonous marshalling of facts in conventional divisions: chapters, and paragraphs. It is at the same time a difficult work to review, calling rather for the lengthy essay of the early nineteenth century commentator than for the short and often superficial sentence of praise or condemnation of the present day. The reader, in this case, will understand that he is to go to the book itself, and not to content himself with the few matters chosen for consideration in this review.

Mr. Hastings Gilford is fond of triads, and he begins with that of growth, nutrition, and development. The chapter in which he distinguishes between these three processes calls for careful reading, for it forms, in many respects, one of the foundation piers on which much of the edifice of the book rests. It is a little difficult also to accustom oneself to the conception of senile degeneration being identical with retrogressive development, indeed, "retrogressive development" itself is rather an elusive and paradoxical idea. As in all books which break up new ground, the terminology is apt to constitute a difficulty, for words take on a new signification to suit new conceptions arising out of the novel conditions set forth; for example, nutrition is not used here in its special relation to food or feeding, but "to a condition which is in part the result of the assimilation of food, and in part of factors of whose nature we know nothing," and this "nutrition" is to be judged of mainly by the way in which an organ, or part, resists bacterial poisons (*i.e.* immunity). As a matter of fact, however, nutrition disappears from the triad in an early part of the book, leaving growth and development to be expanded and discussed at great length.

By making development regressive as well as progressive the author is able to support his thesis that development is coterminous with life. He works out man's second childhood in the terms of physiology, and he has much to say that is fresh, if not absolutely convincing, about the resemblance of old age to infancy, maintaining that the tissue

changes of old age are known quite as much by the reappearance of embryonic characters as by actual decay. But there is a difference, and the tissue changes of second childhood are distinguished from those of first childhood by defective control.

Another triad is that of the cell, the organ, and the complex animal. The human body is made up, first, of cells, second, of organs (which are communities of cells), and third, of the groups of organs which constitute the whole animal; so that every cell of the body leads a triple life. It has its own cellular existence, its co-operative life with other cells in an organ, and its subordinate life as a part of the complex organism which constitutes the individual man or animal.

In development there are two tendencies at work—heredity, which is conservative, and variation, which is changeable, and may be either reactionary or progressive. But development, whilst progressive, has periods of greater or less energy and rapidity, and Shakespeare's seven ages are not mere poetry but actual periods with intervening climacterics, named (*e.g.* birth, puberty, menopause), or unnamed, (*e.g.* that between babyhood and childhood). Mr. Hastings Gilford accepts the theory that menstruation is in many respects a miniature childbirth, and has its cyclical increase and decrease of development. He might well have made use of the Stephensonian menstrual wave notion here, for in it lies the germ of the idea that in the male also there is some such cycle of changes as exhibited in urea excretion. He admits the effect of the foetus upon the mother in pregnancy, although he also speaks of the foetus living as a parasite on sterilised food, which it gets from the tissues of its host; but Professor Bar's conception of the mother and foetus, as being in the relationship of harmonious symbiosis, seems to be rather more accurate than the commonly accepted one of parasite and host.

Mr. Gilford brings his two triads into touch with each other when he considers disorders of growth as they affect cells, organs (cell-communities), or the complex body, and when he deals with the more difficult subjects of disturbances of development as they affect these three things (cells, organs, body). Growth may be defective or excessive, and there may be overgrowth or undergrowth in the cell (*e.g.* innocent tumours), in the organ (hyperplasia and hypoplasia of an organ), or the whole body (gigantism, dwarfism); again, development may be defective or excessive (*i.e.* premature) in the cell (malignant growths), in the organ or in the whole body (general infantilism and general senilism).

The rest of this interesting volume is occupied with the detailed examination of the disorders of postnatal growth and development of cells (including some fascinating speculations on tumours, innocent and malignant), of organs (under which are found many disorders which the reader has doubtless not been in the habit of placing here), and of

the whole body (including gigantism, dwarfism, correlated overgrowth, obesity, masculinism, feminism, postnatal hermaphroditism, infantilism and ateleiosis of various kinds, senilism, progeria, centenarianism, etc.).

Even from this brief enumeration of the contents of this volume it will be evident that there is here much food for thought, and many suggestions which call for further testing before they can be freely accepted. It is difficult at first to get on familiar terms with old diseases under their new names, *e.g.* with myxœdema under the synonym of thyroid senilism, and with senilism as it affects the child; but if the underlying principles of Mr. Gilford's theories are firmly grasped, his arguments and conclusions can be followed with interest and a measure of enthusiasm. It matters, perhaps, little in the end whether a man dies of old age or passes away because he has reached his second infancy; but the thoughts evoked by the latter of these conceptions lead on into spheres of speculation, which afford opportunities for much interesting and, it may be, stimulating mental action. Thoughtful and thought-provoking is the character we give the book.

Refraction and Visual Acuity. By KENNETH SCOTT, M.D. Pp. 191.
London: Rebman, Ltd. 1911. Price 6s. net.

THIS little book, according to the author's preface, is principally intended to assist the general practitioner who cannot attend a practical course of post-graduate instruction on Refraction. Abstruseness is avoided and attention is confined simply to the most essential points. As an intimate knowledge of physiological optics for the purpose in view is not needed, the reader is not troubled with optical dissertations, but with those of the most elementary and easily understood kind. So far as it goes we have very few faults to find with the book, but from long experience we feel certain that the only way to acquire anything like an accurate and practical knowledge of the subject, so as to be able to prescribe spectacles correctly, is to attend a course of practical instruction under the immediate supervision of a qualified teacher.

Exception must be taken to the use of the interpupillary distance in determining the optical centring of spectacle lenses, for the visual axis does not as a rule traverse the centre of the pupil. To measure the interpupillary distance an adjustable trial frame is recommended in preference to the graduated millimetre rule. The reverse, in our experience, is preferable, especially if a sliding rule be adopted, which can readily be made by the surgeon himself.

The term mydriatic is used instead of cycloplegic when speaking of drugs employed to paralyse the ciliary muscle. The use of the term mydriatic should be restricted to drugs which dilate the pupil.

In retinoscopy the concave mirror is selected by the author, although the plane mirror is preferable and is now almost universally used.

The chapters on colour blindness and simulated blindness are good, and in the chapter on the medical inspection of school children many useful hints will be found.

Part II.—Visual Acuity in the Public Services—is much more fully dealt with than in any other book of the kind we know of, although perhaps unnecessarily so, for few, if any, of the readers of the book will find it necessary, for example, to know anything regarding the conditions required in the railway service in far-off Japan.

Altogether the book will be found useful and reliable, but we must repeat that it can never replace the practical training found in the ophthalmic clinique, where the subject is taught by a competent teacher.

Handbook of Treatment for Diseases of the Eye. By Dr. CURT ADAM, Assistant-Surgeon in the I. University Clinic for Diseases of the Eye, Berlin. Translated by Drs. SYM and LITHGOW, Edinburgh. Pp. 264. London: Rebman, Limited. 1911. Price 10s. net.

THIS book is primarily designed for the service of the surgeon in practice, and it must be gratifying to the author that within the short space of one year it has undergone two editions, which in itself is sufficient proof of its usefulness.

For this translation from the second German edition we are indebted to Drs. Sym and Lithgow of Edinburgh, and we congratulate them on their successful efforts in placing at the disposal of English-speaking surgeons the methods of treatment practised in the great University Eye Clinic of Berlin.

Throughout the subject-matter is presented in such a succinct form that the surgeon can, with the least possible difficulty, furnish himself with the methods of treatment most applicable to any case under consideration.

The part of the work which interests us most is that devoted to general and modern methods of treatment. Here serum diagnosis is fully discussed, the very latest in this important subject being presented in a most clear and lucid manner.

Then follows the special part dealing with the diseases of the different parts of the eye and adnexa. Here it is interesting to note that the practice pursued in Berlin is in great measure similar to that of many ophthalmic surgeons in this country. We note with considerable interest in passing that our Berlin *confères* are not afraid of the so-called dangers of cocaine, for apparently the drug is employed fearlessly, even in corneal affections, with undoubted success. It is

somewhat curious to observe that in the preparation of ointments the salts of alkaloids, although insoluble in fats and oils, are employed instead of the alkaloids themselves which are soluble.

The whole book is full of interest and will repay careful perusal, not only on the part of the general practitioner but of the ophthalmic surgeon, and we most heartily recommend it as an up-to-date and reliable guide to ophthalmic therapeutics.

The Refraction of the Eye. By GUSTAVUS HARTRIDGE, F.R.C.S.
Fifteenth Edition. London: J. & A. Churchill. 1911. Price
5s. net.

In preparing the fifteenth edition of this popular manual for students studying the refraction of the eye the author has carefully revised the book throughout and has made various additions without affecting the original plan.

In the chapter devoted to hypermetropia the time-honoured statement that "a considerable number (of hypermetropes) become emmetropic as they get older, and a certain percentage of these pass on to myopia," should in a subsequent edition be considerably modified, for in actual practice one finds that hypermetropia, as a rule, remains practically stationary throughout life.

No doubt the most useful remedies we possess in dealing with cases of progressive myopia showing symptoms of irritation are complete rest, cycloplegia, and plane neutral-tinted glasses, but we have never seen any benefit derived from the use of either counter-irritation or artificial leeching. The use of dionin instillations, which is admittedly both rational and beneficial, is not referred to, and the modern theories regarding the etiology of concomitant strabismus are conspicuous by their absence.

Although a few other omissions are noticeable, yet, as a manual for students studying this important branch of ophthalmology, we have no hesitation in saying that the book before us, so far as it goes, is not only a safe and reliable guide but one of the best in this or any other language.

Ophthalmic Therapeutics. By Dr. A. DARIER, Paris. Translated by
SYDNEY STEPHENSON, M.B., London. Pp. 444. London:
Rebman, Ltd. 1911. Price 17s. 6d. net.

THIS compact well-illustrated octavo volume, one of an International System of Ophthalmic Practice edited by Walter L. Pyle, M.D., Philadelphia, is written by Dr. A. Darier of Paris and translated by Dr. Sydney Stephenson of London. It provides a convenient and thoroughly up-to-date digest of ophthalmic therapeutics, together with the results of the latest investigations connected therewith.

Part I., consisting of 194 pages, is devoted to general therapeutics, such as methods of diagnosis, constitutional treatment, extra-oral medication, intra-ocular and subconjunctival injections, serum therapy, diaphoretics, heat and cold, phototherapy, electricity and electrotherapy, X-ray and radium, hydrotherapy, anaesthetics, analgesics, mydriatics and myotics, etc.

Part II. deals with special therapeutics in 213 pages, *e.g.* diseases of the orbit, lachrymal apparatus, eyelids, conjunctiva, cornea, sclera, uvea, vitreous, retina and optic nerve, together with a chapter on the treatment of glaucoma.

The whole work, written by one of the foremost ophthalmic therapeutists of the day, contains a mine of information of the most authoritative character, and is one of the most reliable books of reference available. It is indeed indispensable to the ophthalmic surgeon who wishes to keep abreast of the times in the rapidly advancing subject of modern ophthalmic therapeutics.

The printing, paper, and general character of the book leave nothing to be desired, and the work as a whole reflects the greatest credit on all concerned.

A Text-Book of Bacteriology. A Practical Treatise for Students and Practitioners of Medicine. By PHILIP H. HISS, Jr., M.D., and HANS ZINSSER, M.D. Pp. 745. London and New York: Appleton & Co. 1910. Price 15s. net.

It would be difficult to deal with all the branches of the science of bacteriology within the compass of an ordinary text-book, and as a matter of fact the present volume professes only to treat of medical bacteriology. At the same time, very properly, non-pathogenic organisms likely to be met with in the course of clinical and pathological investigation are also fully described.

The volume commences in the usual way with chapters on morphology classification and biological activities of bacteria, followed by others dealing with sterilisation, media making, staining, etc. Section 2 is devoted to the complicated subject of immunity and the consideration of allied questions, such as the Wassermann test, opsonins, and vaccine therapy.

The pathogenic micro-organisms are dealt with in Section 3. There is a rough attempt made at classification founded on morphological resemblances, not upon similarities, in the diseases produced, a method no doubt perfectly sound.

One would have thought, however, that the evidence in favour of the bacillus tuberculosis belonging to the streptothrix group of higher bacteria, if not the fact of the similarity of the lesions, was sufficiently strong to warrant its inclusion among the latter along with actino-

myces. The colon-typhoid-dysentery group is very naturally considered an entity, and several chapters are devoted to its discussion.

The next section deals with diseases of unknown etiology, and an exceptionally interesting account of the American work on yellow fever is given. Rabies, also, and smallpox are fully discussed from the bacteriological standpoint.

Lastly, there is a section devoted to bacteria in air, soil, water, and milk. In this the public health and industrial aspects of the subject are considered shortly.

The book is a thoroughly sound one, and the illustrations, which are nearly all original, are good. Some of the photo-micrographs would be improved by cutting out peripheral portions which are out of focus. There is a useful diagram showing graphically the sugar reactions of the typhoido-colon-dysentery group of bacteria by means of coloured squares.

Observations upon the Natural History of Epidemic Diarrhea. By O. H. PETERS, M.D., D.P.H. Pp. 177. Cambridge: At the University Press. 1911. Price 7s. net.

THE etiology of epidemic diarrhœa has been much discussed during recent years, and we welcome this valuable addition to the literature of the subject. Dr. Peters has made a searching investigation of the incidence of the disease in the town of Mansfield, and in particular founds his conclusions upon experience gained by the detailed study of diarrheal attacks in two selected areas of the town which differed considerably in their character, and which illustrated two different methods of sewage disposal—the water-closet and conservancy systems. He discusses at length the influence exerted by personal infection, fly carriers, soil, dust, milk, water, fruit and food infection, and the interrelation of temperature, flies, rainfall, and diarrhœa. His observations on all these subjects are illuminating, and show evidence not only of laborious study but of a well-balanced judgment. While he is more anxious to detail the results of his experience than to give dogmatic conclusions he considers that there is a mass of evidence in favour of personal infection and fly carriage, whereas there is but little in support of the “ground theory.” The provision of water-closets appears to be a point of minor importance, as in the case of the young children chiefly affected by the disease closets are not as a rule employed, even if they exist, the cloths being changed in the living rooms and affording great opportunities for the leakage of infection. The immunity enjoyed by breast-fed infants is well emphasised, but Dr. Peters considers that milk plays little or no part in introducing diarrhœa into the home. Boiling milk appeared to produce no effect at all; if anything, it seemed to increase the liability to diarrhœa—a fact in accordance with the well-known views of Vincent. Peters regards this as suggesting that certain vital pro-

perties which inhibit the growth of disease organisms are destroyed by boiling. On the whole he inclines to the fly theory of infection as being more compatible with the increased spread of the disease at the time these insects are most prevalent, but throughout his monograph he adopts a very cautious attitude as regards definite conclusions. Interesting diagrams illustrate a most complete and scientific study of this debated question, and the book should be read by all who are interested in epidemiology and public health.

The Mechanism of the Heart Beat, with Especial Reference to its Clinical Pathology. By THOMAS LEWIS, M.D., M.R.C.P., D.Sc. Pp. 295. London: Shaw & Sons. 1911. Price 16s. 6d. net.

THIS work is an important contribution to the literature on cardiac physiology and pathology. During the last eight or nine years so many additions have been made to these branches of cardiology that a monograph, even although it covers only a portion of the field, is undoubtedly welcome. The author has already published in *Heart*, of which journal he is the editor, many of the original observations with their accompanying illustrations that are now grouped together in one volume. The text is freely illustrated by electrocardiographic and polygraphic tracings. It is unfortunate that in a number of the latter the "index marks" are lacking, so that the reader is unable to analyse the tracings to his own satisfaction.

The work demonstrates that records obtained by means of the polygraph and string-galvanometer enable us to analyse a disorderly cardiac mechanism with much precision, and to draw many definite conclusions regarding the nature of the disorder. Following the opening chapters on the primitive muscle tissue of the heart, the analysis of the normal venous pulse and the electrocardiogram, the author discusses the evidence concerning the origin of the heart beat in the sino-auricular node. Heart-block is then discussed under three headings—experimental, clinical, and pathological. The difficult subject of the extra-systoles and "heterogenetic rhythms," regarding which much light has been thrown by electrocardiographic studies, is next considered in detail. Thereafter auricular fibrillation is dealt with; and the subsequent chapters are concerned with such subjects as auricular tachycardia, the influence of the vagus upon the heart, the Adams-Stokes syndrome, and alternation. Regarding the essential nature of alternation, the author's conclusion is that no definite opinion can yet be entertained. One of the most important features of the work is the attempt that is constantly made to demonstrate the identity or similarity of cardiac disorders as seen in clinical work with those which have been experimentally induced and studied in the laboratory. If the author's method of presenting his subject is sometimes rather obscure, this is doubtless inevitable owing to the complexity of the problems he is expounding.

Hospital Management. Edited by CHARLOTTE A. AIKENS, formerly Director of Sibley Memorial Hospital, Washington. 12mo of 450 pages, fully illustrated. Cloth, 13s. net.

THIS publication is described by its editress as "A Handbook for Hospital Trustees, Superintendents, Training-School Principals, Physicians, and all who are actively engaged in promoting Hospital Work," and a perusal of its contents fully justifies its claim to be so titled. The various contributors, it is apparent, have been carefully chosen, and each speaks in an authoritative and illuminating manner on the particular branch with which he or she deals. While naturally treating the subject from the American standpoint and containing observations and suggestions that are only applicable in that country, there still remains much that will prove helpful to those connected, either in a professional or a lay capacity, with hospital work in the United Kingdom. If one may venture to particularise, where all are excellent, the chapters on A General Hospital for 100 Patients, The Furnishings of 100-Bed Hospital, Hospital Book-Keeping, The Hospital Store, The Purchase and Economic Use of Surgical Supplies, will be found of special interest to those actively engaged in institutional work. The plates with which the book is furnished help materially to the understanding of the constructional and furnishing articles.

Some New and Interesting Points in Ship Hygiene. By W. MELVILLE-DAVISON, M.B., B.S. Pp. 84. Bristol: John Wright & Sons, Ltd. 1911. Price 4s.

THIS little volume, whose "appeal is primarily to owners of steamships," as stated in the preface, consists of only six chapters. The author deals in a practical manner with the important question of how to ensure the purity of the drinking water on ships, advocating strongly the use of a prefilter. In view of the probable spread of yellow fever to the East (when the Panama Canal shall have shortened the journey from its present haunts), practical methods of mosquito-screening at sea are fully described; and the record of the author's experiments in rat destruction, by intensified "virus," is worth studying. Bugs have a chapter devoted to them; but it is in the cockroach that the author finds "unseen though terrible dangers," regarding it as "the greatest enemy of the human race, with the possible exception of the mosquito"—this being in virtue of his belief that amongst its numerous intestinal parasites are to be found the causes of beriberi and scurvy. To bacteriologists his proofs may not be convincing, but, taken as a whole, this book, written for the promotion of the comfort and health of all sea-voyagers, is interesting and worthy of commendation.

Puerperal Infection. By ARNOLD W. W. LEA, M.D., B.S.(Lond.), B.Sc.(Manch.), F.R.C.S.(Eng.), Lecturer on Obstetrics and Gynæcology, The University, Manchester, &c. Pp. xvi. + 384. With 23 Figures and 35 Plates (8 in Colour). London: Henry Frowde, Oxford University Press; Hodder & Stoughton. 1910. Price 25s. net.

DR. LEA has written a large and elaborate monograph on puerperal infection. There are chapters dealing with the historical aspects of the subject, with the definition and classification, with statistics as to frequency and morbidity and mortality, with its bacteriology, its pathology and pathological anatomy, with symptoms, with diagnosis, and with treatment. The treatment is, as indeed it should be, dealt with in great detail (more than 100 pages being devoted thereto), and considerable space is given to prophylaxis, for, after all, puerperal infection is preventable and ought therefore to be prevented. Dr. Lea wisely draws attention to the dangers which may arise in pregnancy from erythematous and eczematous conditions of the vulva, from inflammation of Bartholin's glands, from inflamed or prolapsed hæmorrhoids, and from a fistula in ano. In the presence of vaginitis in pregnancy regular vaginal douching is recommended, and if it be gonorrhœal in nature a thorough disinfection of the canal is indicated. The interior of the vagina is cleansed with an alcoholic solution of soap and then a strong solution of nitrate of silver (10 grs. to the ounce) or of protargol (10 per cent.) is applied; the canal is next packed lightly with iodoform gauze, and douches are given later. The author does not, however, recommend vaginal douching in labour under ordinary circumstances—it is far more important to carry out complete antiseptics of the vulva—but in exceptional cases it is recommended, *e.g.* in purulent vaginitis, prolonged labour, fever during delivery, and operative delivery (other than uncomplicated forceps cases). Gloves are to be used in certain instances. The immediate repair of injuries arising during labour is rightly insisted on strongly, for every wound may become the starting-point of an infection. Great caution is to be exercised regarding early rising in the puerperium, and the author is evidently not enamoured of the propaganda which hastens the resumption of the erect posture. The chapters on serum treatment of puerperal sepsis, on the intravenous injection of antiseptics, on immunisation by vaccines, and on operative interference are written with wisdom and caution; indeed the whole book is a careful and well-balanced exposition of a difficult and complicated subject. It would be well if it were studied by all obstetric physicians in charge of maternity hospitals.

Vaginal Cœliotomy. By S. WYLLIS BANDLER, M.D., Professor of Diseases of Women, New York Post Graduate Medical School. Pp. 450, with 148 Illustrations. Cloth, 21s. net.

THIS work takes a fair-minded view of vaginal cœliotomy without voicing the extreme praise meted out to this operation by enthusiasts in its favour.

That vaginal cœliotomy has a distinct place in the domain of gynæcological surgery, only those who have no experience of it will gainsay. We doubt its value in conservative operations upon the adnexa, as this in many cases necessitates more elaborate methods than simple puncture of cysts.

With the author's indications for vaginal hysterectomy we are in agreement, but no mention is made of Mayo's method of preventing cystocele after this operation.

Vaginal fixation and its indications are discussed fully. We are in accord with much that is stated, and we think that against those who are unfamiliar with the operation and condemn it without a trial the author has presented a very strong case. The value in marked cystocele is undoubted.

We consider that the insertion of a finger into the rectum in any perineal operation is unnecessary, and not in accordance with modern technique, and must deprecate its use as depicted in Figs. 88 to 91.

The author is to be congratulated on presenting the subject in the English language, and will do much to overcome the prejudice to vaginal surgery, where it is frequently condemned by gynæcologists without a trial. The large number of illustrations and the contents make the book easily read, and render a difficult subject clear when it has been often little understood.

Maternity Primer. By A. H. F. BARBOUR, M.D., LL.D. Pp. 165. Edinburgh: Wm. Green & Sons. 1911. Price 1s. net.

THIS dainty book of 165 pages, with its simple title, *Maternity Primer*, consists of, as the preface informs us, notes privately printed for the use of nurses commencing their maternity training, and now published by request. It has a character of its own, different from that of the ordinary text-books on the subject. The style throughout is colloquial, familiar words have been used rather than scientific terms, and it is thus reminiscent of the early works on Midwifery addressed to women and men midwives, yet thoroughly up to date.

The subjects are well arranged under respective headings, no important point is omitted, and each one is dealt with in a separate paragraph; these are numbered "to save repetition and facilitate reference." At the end a useful series of questions is set with reference to the paragraph dealing with the subject—a valuable aid to the student.

As a Primer or as a note-book to lectures it fulfils its function, but there are parts where fuller detail might be desirable.

EDINBURGH MEDICAL JOURNAL.

EDITORIAL NOTES AND NEWS.

The National Insurance Bill.

THE condition in which the National Insurance Bill has emerged from the Committee stage gives the medical profession little cause for satisfaction.

After endless negotiation and many specious promises of amendment we find ourselves in no more favourable position than when the Bill was first introduced. Changes from the original proposals there have been, but such as were designed to meet the objections of the medical profession have subsequently been so modified and qualified as to render them almost nugatory, and in the process of transformation provisions have crept into the Bill which, in the opinion of many, render it even more objectionable than it at first was.

There may be room for difference of opinion as to the further action of the profession and as to the time and manner in which it shall declare its inability to accept the conditions established by the Bill as it now stands.

The representatives of the British Medical Association have decided not to bang the door on all further negotiations, and to continue to endeavour to get incorporated in the Act the substance of its "six cardinal points." Should they fail to do so, they are resolved to enter into negotiations with the Insurance Commissioners, and if these do not lead to a satisfactory result, the Association will use all its influence to prevent its members from undertaking any duties under the Act.

In the light of what has passed we confess that we do not entertain any lively hope that further amendments made in the Report stage will go far to render the Bill acceptable to the profession, nor do we look forward with confidence to the prospect of attempting to extract from the Insurance Commissioners conditions which Parliament itself has refused to grant.

In its present form, and we fear there is every reason to expect that so far as the medical provisions are concerned this will be its final form, the Bill is one which no medical man who has the real interest of the public and of his profession at heart can have any part in administering.

To say so now in no way debars us from considering any further concessions that may be offered, and, if these meet our wishes, of taking our part in carrying out what we hope and trust may prove a beneficent measure.

By declaring at this juncture our determination to refuse to accept office under the Bill if it goes forward in its present form, the onus of passing an unworkable measure is thrown on those who are responsible for its terms.

In expressing our conviction that the Bill establishes conditions which no medical man should voluntarily accept, we feel sure we are in agreement with the great body of the profession in Scotland.

**The Royal Medical
Society.**

PROFESSOR SAUNDBY'S address at the opening of this winter's session was a real treat to those who had the pleasure of hearing it, and it has no doubt been enjoyed by the wider circle who had the opportunity of reading it in the *British Medical Journal*.

His references to his teachers in Edinburgh in the early seventies were most interesting, and were marked by a refreshingly truthful candour of criticism. It is good for teachers to hear this sort of criticism, for though it applies to others, not a few of us could take useful hints to ourselves from it. Of one he says, "his mind had become rigid;" of another that "he had lost much of his old energy and spirit;" and of another that "he took infinite pains in the examination of his patients, but he hardly noticed us students, and did not help us to follow what was in his mind." This last is a criticism we should all lay to heart.

Professor Saundby pays a warm tribute to the memory of Dr. George Balfour. It is one of the great strengths of the Edinburgh school that our freedom of teaching among a large hospital staff enables an intelligent student to select for his master the one whose influence he feels most; it is not always the man who has the largest clinique who is the best teacher for A, or B, or C.

Professor Saundby set an example which we should like to see more largely followed to-day. He stayed up through the vacations to work. We do not suggest that students should have no holiday, but we do feel that now that the summer vacation extends over three months some of them will follow Saundby's example. His advice to those who are not fortunate enough to secure resident posts in the Royal to apply to the English provincial hospitals we cordially commend. There is nothing so useful as a period of residence under a keen chief. Professor Saundby referred with envy to a recent German ordinance under which all medical graduates in that country are required to spend a year as residents in a hospital, and advised all earnest

students to do of their own free will what their German brethren were compelled to do.

Professor Saundby concluded with some really sensible remarks on the prospects of those who enter the medical profession which are a welcome relief to the tone of gloomy pessimism which is the fashion to-day. He does not believe that medicine is "an overcrowded, underpaid, and miserable occupation," and he suggests that those who speak of it as such must shut their eyes to the state of things in other professions, and challenges them to point to any open calling in which the chances, and even the average pecuniary prospects, are better or so good. And this from the President of the British Medical Association! Altogether a most stimulating address, and one well worthy of the careful perusal of every teacher of medicine.

Medical Teaching and Practice in Ontario.

IN the September number of *The Canadian Journal of Medicine and Surgery* an interesting account is given of the development of medical teaching and medical practice in the great province of Ontario. The writer is Mr. Justice Riddell of the High Court of Justice, Ontario, and he extricates the essential details of the numerous medical statutes in a very clear manner. With the same legal precision he traces the rise, development, and amalgamation of medical schools.

The province was detached from Quebec in 1792, becoming a separate colony under the name of Upper Canada. In 1867 it assumed the new style of Ontario. Medical practice was almost uncontrolled by statute until 1819, when a Board was appointed "to hear and examine all persons who desired to practise physics, surgery, and midwifery, and, if satisfied, certify the same to the Governor, who would, if satisfied of the loyalty, integrity, and good morals of the applicant, grant a licence." This continued to be the licensing board until 1865, when a "General Council of Medical Education and Registration of Upper Canada" was established. This statute, even by its title, was plainly of kin to the British Medical Act of 1858, which gave to us our General Medical Council and our Medical Register. With not very essential alterations the main provisions of the Act of 1865 are in force in Ontario at the present day.

The organisation of medical teaching followed this regulation of medical practice rather tardily. Almost up till the middle of last century no school of teaching existed in Ontario. Applicants for licence received their training as apprentices of licensed practitioners in the province, or came from the Medical Faculty of McGill University, or from medical schools in the United States and mother country; but in 1844 the University of King's College, Toronto, including a Medical Faculty, was inaugurated, and by 1850

three medical schools existed in Toronto. These rival schools, after many changes in name and fortune, are now merged in the Medical Faculty of the University of Toronto. The other schools of the province at the present day are the Medical Faculty of the University of Kingston and the Western University Medical Department at London. Both at Kingston and Toronto the Medical Faculty offer women students full facilities for medical study.

The Journal. THE Directors have elected Dr. Norman Walker to the vacancy on the Board caused by the death of Dr. Joseph Bell, and Dr. J. S. Fowler has been appointed joint editor with Mr. Miles.

Appointments. PROFESSOR CAIRD has been appointed William Banks Memorial Lecturer in the University of Liverpool.

Mr. A. Pirie Watson, M.A., M.B., Ch.M., F.R.C.S., has been appointed Pathologist to Leith Hospital *vice* Dr. J. H. Harvey Pirie, resigned.

VALEDICTORY ADDRESS TO THE EDINBURGH
OBSTETRICAL SOCIETY.

By F. W. N. HAULTAIN.

SOME REMINISCENCES OF SIR JAMES Y. SIMPSON'S ASSOCIATION
WITH THE EDINBURGH OBSTETRICAL SOCIETY.

BEFORE vacating the chair it is the usual custom of the retiring President to give an account of his stewardship in a short recount of subjects of outstanding interest which have occurred during his occupancy of the chair.

These resolve themselves, in the majority of instances, into a résumé of the work of the Society, and the mournful duty of dwelling shortly on the gaps in our ranks caused by the ever-present hand of death.

It is not my intention on the present occasion to shirk this responsibility, but having the good fortune to occupy the chair on the hundredth anniversary of the birth of our greatest Fellow, James Young Simpson, it seems incumbent upon me to refer with some fulness to his association with our Society.

This duty, though pleasant, is to one of my moderate literary capacity an extremely difficult one. An attempt even to name his numerous contributions would far exceed the time at my disposal. I shall confine myself, therefore, to some of the more outstanding features of his fellowship.

Though, curiously, not one of the twenty original members, he was proposed and seconded at the first meeting of the Society on 14th January 1840 by Drs. Ransford and Beilby, elected on the 27th, and on 9th March he signed the laws and paid the entrance fee. He at once cemented his association with the Society by showing the external genitals of a female with central perineal tear through which the child was born, and he presented a wax cast of the condition at the following meeting. During his first year he brought forward no fewer than eighteen communications, perhaps the most noteworthy of which, from a present-day point of view, was the differential diagnosis of fibroid from ovarian tumours by auscultation and detection of the bruit.

After nine months' ordinary fellowship he was elected Vice-President, and in the following year, 1841, was promoted to the President's chair, which he occupied for sixteen consecutive years.

On 14th December of this year his name first appears in the minutes as Professor.

Perhaps his most interesting communication during this session was a description of the new operation of cephalotripsy, which he criticised most unfavourably.

What might be termed his first classic, so far as the Society was concerned, appeared next year, 8th November 1842, viz. "On the Diagnosis of Diseases of the Womb by the Employment of Uterine Bougies," or, in other words, the uterine sound. In this paper he dilated on the uses of the sound from a diagnostic and therapeutic aspect, and finally proposed the permanent retention of the bougie, in the form of an intra-uterine stem pessary, for the treatment of uterine displacements.

With the introduction of the sound a new era in gynecology may be said to have begun, and pelvic diagnosis was placed on a scientific basis. It is strange to think in recent years it has been decried by ultra aseptic gynecologists as a dangerous, useless instrument, and in some medical schools its very existence is ignored. Like every other appliance, its value depends on the manner it is used. From personal experience of its constant use I can frankly state that, as an aid to diagnosis, it is *the* gynecological instrument I could least easily do without, and after using it in many thousand of cases I have yet to see one where the least semblance of an ill effect followed. If Simpson had done nothing more than evolve the use of the sound, his name would have still been lastingly revered in the science of gynecology.

Though he read many interesting papers in the interval, it was not till five years later, 20th January 1847, that any of outstanding importance was offered. On this occasion the first indication of his *magnum opus* was given in a communication on a case of turning under the influence of sulphurous ether. In this instance he delivered a living fetus from a woman whose previous labour had with difficulty been finished by craniotomy.

The case is of especial interest from three points of view:— Firstly, it was the first instance in which ether inhalation had ever been used during labour, and was destined to form the commencement of a new and important epoch in obstetric practice. This is of special importance with regard to the Boston controversy as to priority. Secondly, it was the text for a series of valuable articles on "Turning as an Alternative to Craniotomy," which were published in the *Monthly Journal of Medical Science*, and subsequently took the form of an essay which he distributed to his students.

Thirdly, it is of special interest to me, as with Simpson's sanction the patient left her bed, dressed, and walked into the next room on the 4th day, in spite of which she made a recovery which was uninterruptedly good and rapid.

The author seems to have been led to the adoption of turning by noticing the apparent ease with which cases where the breech presented were delivered, where previously there had been much difficulty with vertex presentations. The essay is brimful of interesting and valuable suggestions, amongst which are the mechanism of labour of the aftercoming head in a flat pelvis as taught in the present day; the increased dangers to the mother closely corresponding to the duration of labour after twelve hours; and the value of auscultation during labour as an indication for interference.

At the subsequent meeting he read a paper on the "Inhalation of Ether in the Practice of Midwifery," and related a case of the inhalation of laudanum which was successfully used for the inhibition of persistent vomiting of pregnancy. From these it is evident the subject of anaesthesia during labour was engrossing his attention, and leading to the magnificent discovery of chloroform, which has established his name throughout the civilised world as one of the greatest benefactors of the human race.

Curiously enough the first mention of chloroform, so far as the Society is concerned, is more or less of an aside, when it was said (in 1849) to have been administered in a case of puerperal convulsions. The original communication on this all-important subject of chloroform anaesthesia was read before the Medico-Chirurgical Society, 10th November 1847, entitled "A New Respirable Anæsthesia."

On the same evening (29th January 1847) that he related his case of turning under ether he delivered a most interesting communication on "Gutta-Percha for Obstetric Instruments," in which he showed its value as a readily adaptable substance for the use of pessaries, and amongst its other benefits mentioned the readiness with which it was procurable by medical practitioners in an emergency, as they could, by soaking their walking sticks in boiling water, at once acquire sufficient material for such obstetric purposes.

A long and inspiring series of articles on "Fibroid Tumours of the Uterus" were read during the May meetings of 1847, where he heralds the teaching of modern times by decrying the induction of abortion when these growths complicate pregnancy, and fore-

stalls Apostoli by suggesting the galvanic current to promote atrophy and calcification.

The following month we find a learned dissertation from his pen on the association of albuminuria during pregnancy with disease of the kidney, in which he shows that when convulsions supervene there is a marked diminution in the quantity of urine passed and the amount of urea it contains, while at the same time he dilates on their frequency in primipara as compared with multipara, and states the tendency to complete cure of the kidney lesion.

In this connection, in a subsequent paper in May 1854, he discusses the advisability of inducing labour in cases of severe albuminuria, and proposes the method of induction by passing the sound between the membrane and uterine wall, in a manner similar to the now universally adopted Krause's method. This latter means Simpson strongly advocated in a later exhaustive dissertation on the induction of labour (May 1860).

At the discussion on the paper it is interesting to note that Dr. Keiller reminded the Society of what he had before suggested as regards the value of elastic bags introduced into the uterus and filled with air; these were later filled with water, and widely known as Barnes's hydrostatic dilators.

A series of articles follow on "Puerperal Complications," the most valuable of which is published in the *Edinburgh Monthly Journal of Medical Science*, July 1851, under the title of "Communicability of Puerperal Fever." In this he lays special stress on the disease being acquired in the majority of instances not by direct infection from one to another, but by the aid of a third party, doctor or nurse, who infects the parturient canal by their fingers.

The infective material he suggests may be derived from—(1) Touching the bodies of patients who died of puerperal fever. (2) From touching the bodies of living patients who are suffering from fever. (3) From the inflammatory secretions of other inflammatory diseases not puerperal. At the same time he points out fever may be occasionally acquired by the inhalation of morbid effluvia through the lungs, from direct contact with typhus and other specific fevers; by the same means it may be inhaled from the clothes of practitioners who had been in direct contact with these cases; and lastly, very occasionally sporadic cases may be met with traceable to no contagion, but due to morbid actions going on in the constitution due to morbid agencies acting upon the patient,

specially during or after delivery. It is interesting to note that he himself disinfected his hands with cyanide of potassium.

Amongst innumerable able and valuable communications which followed, and which time alone prevents me mentioning, there are, from a present-day aspect, two of outstanding interest, viz.—(1) his views on the use of forceps, and (2) his attitude towards the operation of ovariectomy.

In the former he strongly deprecates the practice of the Dublin school, as represented by the statistics of Collins, as stated by Clark, the then master of the Rotunda, who seemed to regard forceps in the light of an extractor in embryulcia.

At the same time Simpson laid down the principle of the teaching of the Edinburgh school, viz. that it was the delayed use of the forceps, not their ready use, in which their supposed danger lay. Since the evolution of the axis traction instrument this reasoning seems to be more forcible than ever, and I trust it will long continue one of the outstanding features of the teaching of our school. Like the use of the sound, the practice has been within late years strenuously attacked. But there is no gainsaying the fact that the cultured ready use of forceps and chloroform is an eminently safe means of diminishing much unnecessary suffering, and may legitimately be considered one of the principles of Edinburgh teaching, of which we well may be proud.

As regards ovariectomy, Simpson, though not a frequent operator himself, was its greatest champion against the leading surgeons of the day, such as Syme and Spence. In 1845 he strongly urged the necessity of its performance, and decried the palliative procedure of tapping. As showing his practical ability, it is interesting to note that to avoid the irritation of the ligature preventing the closure of the abdominal wound he suggested that it be pulled through the posterior fornix vaginae. Had it not been for his strong arguments in favour of the operation against popular prejudice, we probably would never have had the grand pioneer work of Thomas Keith, with whom he was intimately associated.

Although having but touched on the fringe of the immense amount of valuable work which Simpson has made public through our Society, sufficient has been said to impress us with the magnitude of his powers and the extraordinary fertility of his brain. To think of the science of obstetrics and gynaecology without Simpson is equivalent to Hamlet without the prince.

Upon almost every leading subject he has permanently left his impress, and we may well be proud that it was through this Society

that his indelible imprints were chiefly made. Though perhaps the leading subject of his attention, obstetrics by no means alone claimed his thoughts, as the *Transactions of the Medico-Chirurgical Society* fully testify. The discovery of chloroform, which has made him immortal, however, may be said to have been engendered by his sympathetic feeling for the parturient woman in the agonies of labour.

All his efforts seem to have been concentrated on the attempt to diminish suffering. His heart was larger even than his brain, and his generosity knew no bounds. A lady now alive, then in straitened circumstances, tells me his prescription to her was a cheque for £10 with a signetur to take three weeks at the seaside. Wealth or fame had for him no attractions. Interest in his work was his one absorbing theme. A freak in the Cowgate would attract him from a houseful of patients, among them the *élite* of Great Britain. As was to be expected, he had the eccentricities of genius, which by his opponents were misconstrued as the attributes of quackery.

His influence on the medical school was remarkable, and to-day Edinburgh owes its high position in obstetric circles very greatly to his teaching. Ever ready to help and stimulate younger workers, and to give praise where it was due, he collected round him a number of men who, like himself, though in a minor degree, have made history in the departments of obstetrics and gynaecology.

His never-failing courtesy and kindness, quite apart from his profession, can never fade from the memory of those who knew him. The nobility of a character which was ever ready to give the finest products of its genius to assist a deserving cause, and always the first to recognise and applaud the work of others, was associated with an irresistible charm of manner. He was one of those peerless men whose genius was never spoiled by success, and whose work, in directness and sincerity, decorates one of the finest pages in the history of medicine.

To anyone it would be a pleasure, sitting as I do in the chair he so long adorned, to have the duty of recounting his presence in this the centenary of his birth. To me, personally, it is the opportunity of my lifetime. As one of the last, if not the last patient, he attended, though of tender years, I can with pride clearly recall the magnetic influence of the man. The short burly figure, the large head with long unkempt hair, the strong face, the musical voice, and those sympathetic eyes which fascinated the highest and the lowest of the land, are to me as of yesterday. The eagerness

with which I looked forward to the almost daily visits, which for weeks on end he paid, is an everlasting memory. The debt of gratitude I owe him I can never repay. To have thus had the honour of feebly recalling his memory must suffice.

Before leaving this subject I should like to ask what has been done and what is being done to honour his name? As tangible proofs of his existence we have a bronze statue in the Gardens and an obsolete Maternity Hospital which is a disgrace to his name and to the obstetric school of which he is the figurehead. Is not this a fitting occasion to raise a hospital more befitting to the man? Surely even in these days of financial oppression it might be hailed as an opportunity for a grateful public to testify their gratitude to their benefactor, in a manner similar to that in which he spent his life, by helping suffering women, and erect a suitable Maternity Hospital. A penny from each person who had directly benefited from the use of chloroform would build a hospital finer than any in the world. It seems to me there can be none more fitting to take the initiative in the movement than our Society, in whose precincts so much of his work was unfolded, and who at the same time have the progress of obstetrics so thoroughly at heart.

Though the death roll in our Society has not been large during my term of office, it contains the names of two of our late secretaries—George Keith and James Andrew.

Dr. Keith's association with the Society is ancient history. He joined in 1845, and was secretary from 1847 to 1849. In his early days it would seem as if he gave promise of doing good work in obstetrics, and he was closely connected with Simpson as his assistant and colleague. Perhaps the most striking episode in his career was his intimate association with the discovery of chloroform, for he was one of the few who were found under the table on its initial exhibition.

His curious bent of mind, unfortunately, turned his talents into other channels. His advocacy and practice of the "simple life" showed much force of character, which one cannot help thinking might have been directed with greater benefit to mankind in the sphere of obstetrics than in the doctrines of water, starvation, and earth closets.

He was an attractive personality, and for many years enjoyed a large family practice, from which he retired twenty-five years ago. He was the elder brother of the great Thomas Keith, to whom we gynæcologists owe so much.

James Andrew was secretary from 1871 to 1875, but since his

resignation had taken no prominent part in the proceedings, his attention being mainly devoted to the kindred branch of diseases of children. As President of the College of Physicians he attained high distinction. Many here will remember his genial portly presence, and I know I am expressing the general feeling when I say that it is with much sorrow we realise he is with us no more.

To reflect on the work done by the Fellows during my presidency is most gratifying, and shows the Society to be as active as at any time of its career.

To enumerate the papers is superfluous, to individualise would be invidious. Both from a scientific and practical aspect we have ample evidence of energetic and enthusiastic workers, whose efforts have attained a high level, and give promise of maintaining the Society in the prominent position it has so long held.

It is to be regretted that no discussion on a subject of practical interest has been held, as also that general practitioners are so diffident in bringing forward cases which would lead to general discussion. These delinquencies, I trust, may be remedied in the near future.

In conclusion, I should like again to thank the Fellows of the Society in general for the high honour they have done me, and the secretaries in particular, for lightening the heavy responsibilities of the chair, the vacation of which is associated with but one pleasure, viz. that it is to be occupied by my friend and colleague, Dr. Haig Ferguson, whom, in your name, I heartily welcome.

ON CESAREAN SECTION AND REPEATED CESAREAN SECTION FOR CONTRACTED PELVIS, WITH NOTES OF A CASE SUCCESSFULLY PERFORMED FOR THE THIRD TIME ON THE SAME WOMAN.*

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CESAREAN section has become in recent years an operation so extensively practised by the obstetric surgeon, and one with which he is so familiar, that I had at first some hesitation in bringing the subject before the Society to-night, recognising as I do the frequency with which it is carried out, owing to the increased scope of its indications, and the success which attends at the present day its performance.

My desire to-night, however, is to ask your attention, mainly though not exclusively, to the consideration of repeated Cesarean section, as I am disposed to think there are some points regarding the repeated operation which merit discussion and criticism, and only within the past year the subject has engaged the attention of several of the important obstetrical societies of Europe and America. The history of Cesarean section, although full of interest, is so well known that to enter into it in detail would be an abuse of valuable time, but one might be permitted to recall a few facts relating to its earlier career.

Routh, in a most valuable and elaborate paper on "Cesarean Section," read at an International Congress of Obstetrics and Gynæcology held at St. Petersburg last September, states that the teaching of Mauriceau of Paris, whose work on the *Diseases of Women with Child* was translated into English in 1752, must have greatly influenced British obstetricians. There was certainly no mistaking Mauriceau's view, expressed as it was in the following terms:—"It is a damnable policy martyring and killing the mother to save the child," and advised that a living child be destroyed by embryotomy "rather than resolve upon that cruelty and barbarousness of the Cesarean section in which it is absolutely impossible that a woman should ever escape."

Mauriceau's doctrine apparently had the effect of holding British operators of the day in check, for during the next 70 years—

* Paper read before the Edinburgh Obstetrical Society, 14th June 1911.

until about 1821—only a few were attempted, and all with one exception ended fatally.

The conservative operation from 1821 still struggled on until 1876, with a mortality of not less than 90 per cent. In 1876, however, Porro introduced his method of removing the uterus after delivery, leaving a stump which he treated extra-peritoneally, by fixing it to the wound.

It was not until 1888 that Champneys of London and Murdoch Cameron of Glasgow did the first successful conservative operations, and from this moment onwards the Porro operation seemed to lose favour, while the conservative Cæsarean once more took its stand, now, however, under much more favourable conditions, as the rapidly diminishing mortality shows.

Thus in Glasgow in 1891 the mortality had fallen to 38 per cent.

in 1902	„	„	20	„
and in 1904	„	„	12	„

To-day the mortality of conservative Cæsarean section, when performed for contracted pelvis, when all but septic cases are included, is about 6 per cent.: while in the favourable cases, where Cæsarean section is performed before labour, or before the membranes have ruptured, the mortality is about 2·9 per cent.

My own experience of conservative Cæsarean section has not exceeded six cases, all of which were for contracted pelvis, and successful to mother and child. Three of these were performed on the same woman, the only case on which I have had the opportunity of repeating Cæsarean section.

I shall give the history only of the repeated case.

Mrs. H. had her first confinement on the night of 12th February 1906. She had been in labour all day, and as little progress was being made, her doctor sent for me. I found the head in the L.O.A. position not engaged, and powerful uterine contractions going on, dilatation not complete, and membranes ruptured. Under chloroform one recognised marked disproportion between the head and the pelvis, and I doubted the result of forceps, but attempted delivery with the patient in the Walcher position. A fair trial failing to bring the head through the brim, I performed craniotomy. A large well-developed child was delivered, the extraction even after thorough comminution, and finally a double cleidotomy, being extremely difficult. The recovery was slow but not complicated. Sub-

sequent examination of the pelvis gave the following approximate measurements :—

Intereristal	9 $\frac{1}{4}$ inches.
Interspinous	8 $\frac{1}{2}$..
External conjugate	6 $\frac{1}{2}$..
True conjugate (as estimated)	3 $\frac{1}{4}$..

It is only right to say that this patient had been carefully handled by her doctor before I saw her, the child alive, and I question if I was justified in performing craniotomy.

Second Pregnancy and Cæsarean Section I.—The patient became again pregnant in February 1907, and labour expected about middle of November. By careful examination under chloroform about the 33rd or 34th week one found the head could not be made to enter the brim, and I therefore determined on Cæsarean section as nearly as possible one week before full term. The patient, however, passed into labour two days before I had arranged for the section. The first stage had come on very rapidly, and as it was some hours before it was possible for me to see her, I found her on my arrival in active labour with nearly full dilatation, and preparations for the operation were hastened. This was performed, then, on the night of 6th November 1907. Uterus opened without eventration by median—longitudinal incision—placenta not encountered—bleeding slight—contraction active—puerperium normal, in bed 4 weeks. The child was quite healthy and vigorous at birth, but took a convulsion when 3 weeks old and died suddenly.

Third Pregnancy and Cæsarean Section II.—The third pregnancy was expected to reach term about 28th December 1908, and I hoped on this occasion to perform the section a week before full term. The section was performed on 22nd December 1908. A careful scrutiny of the uterine wall revealed absolutely no trace of the previous scar, and there were no utero-parietal nor utero-visceral adhesions.

Same procedure as in Section I.

Placenta not involved in the incision, and although no uterine contractions were going on as in Section I., the bleeding was no greater. Membranes a little troublesome to detach. The uterus was closed in the usual way, and I made no attempt to produce a utero-parietal adhesion by suturing it to the abdominal wall. Recovery uninterrupted.

Fourth Pregnancy and Cæsarean Section III.—The patient

became pregnant about ten months after her second section for the fourth time, and I performed the third Cesarean probably about a week before labour, on the morning of 10th July 1910. On this occasion, judging from the experience of others, I expected to have to cope with extreme adhesions. To my surprise there were none. All that could be seen of the scar was a fine linear depression less than two ins. in length, so that it was partially obliterated. The uterine incision I made along this linear depression.

I took special note as to the presence of any thinning of the muscle wall in the site of the old scar, but there was no evidence of any. Dr. Haig Ferguson, who most kindly came to this section and who gave me his assistance, also carefully noted the entire absence of any thinning of the uterine wall in the scar region, as also the reduction of the scar to a fine and only partially defined depression.

The placenta was on this occasion anterior, but by making a small incision at first, just sufficient to introduce a couple of fingers, one was able partially to separate the placenta from the uterine wall and then rapidly enlarge the incision to the required length. Bleeding was greater on this occasion, but the uterus, on being eventrated after delivery, responded fairly soon to hot saline swabs. After closing the uterus, sterilisation was carried out by ligature of the tubes in two places, and excision of the intervening portion. Recovery was if anything more rapid than on former occasions, the patient rising on the 12th day.

And now one might here make a passing reference to the operation of induction as compared with an elective Cesarean. Take the case, for example, which I have referred to. The indication for Cesarean section was of course only relative. It was a generally contracted pelvis, with a true conjugate of $3\frac{1}{4}$ ins. Might not the induction operation have been carried out and a living child capable of survival delivered by this method instead of by Cesarean section? We know that the induction of premature labour, of British origin, has always been a favourite one in this country, and when performed about the 34th or 35th week is followed by a comparatively small foetal mortality, especially if the delivery is effected spontaneously, for the moulding which the foetal head can at this period undergo is fully appreciated. There are some obstetricians, *e.g.* Whitridge Williams and Hastings Tweedy, who have entirely abandoned the operation of induction. One must remember that the maternal

mortality is practically nil, while statistics regarding the foetal mortality vary. Thus Herbert Spencer states that in 33 inductions for pelvic contraction he had a 12 per cent. foetal mortality, and Eden, in 101 inductions, had over 13 per cent.

Personally, I have had a considerable experience of the induction operation, having performed it in successive pregnancies in a series of cases, with no foetal mortality when these ended as spontaneous deliveries.

On the other hand, where, after the labour has been induced, and the head has either become arrested at the brim or been well engaged for some hours in the pelvis with no progress, and forceps have then been applied, I have had a high foetal mortality. There must essentially be a time-limit for the application of forceps in every case, whether it be a full-term labour or a premature one, in the interest of both mother and child.

I do not know precisely what percentage of cases of induced labour end spontaneously, but there are undoubtedly cases which require forceps, and the foetal mortality in such cases in my hands has been nearly 50 per cent. As regards the application of forceps, there must, as I have stated, in induced labours as in others, be a time-limit, but it is impossible to measure it in stated hours—it can only be properly measured in one way, and that is by good judgment on the part of the operator, which can only be acquired after years of experience. No matter how easy it may be possible accurately to measure a pelvis, and it is by no means always so easy, the relation of the size of the child's head to the size of the pelvis is of first importance—in other words, as Dr. Barbour pointed out, the foetal head is the best pelvimeter. If, then, at the 34th week the head cannot be pushed through the brim under an anæsthetic, the chances of a spontaneous delivery after an induction with survival of the child becomes a very uncertain matter, and this is where Cæsarean section becomes the operation of choice.

The Different Methods of Operating.—The usual method of conservative Cæsarean section introduced by Säger a quarter of a century ago, and now so extensively and successfully practised, has obtained an important place in obstetrical operations.

Various operators proposed and practised different incisions of the uterine wall. Thus Cohnheim proposed an incision in the posterior wall, Caruso a sagittal fundal incision, strongly supported by Morisani. The incisions, however, which found most favour were a longitudinal in the anterior wall, or a transverse

at the fundus, as proposed by Fritsch in 1897, and the two incisions for years vied with each other in the hands of continental operators.

Quite apart, however, from the variations in the incision site of the modern intra-peritoneal Cesarean section, the desirability of being able to empty the uterus by some method which would be purely extra-peritoneal began to engage the attention of obstetricians.

Nurnbergen points out that the idea of extra-peritoneal section was proposed so long ago as 1806 by Jorg, and actually performed by Ritgen in 1821. The method did not, however, attract real attention until Frank of Cologne published his first cases in 1907, and since he described his first operative procedure many modifications have been made upon it.

The original aim of Frank was to be able to empty the uterus in any case which seemed likely to have become infected, without contaminating the peritoneal cavity by any discharges which might escape into it from the uterus during the process of delivery. Whether such original aim of Frank and of those who followed him has been realised we shall refer to later.

Frank's Operation.—With raised pelvis, a transverse incision is made through the whole abdominal wall, a little above the symphysis. The recti are widely separated. The peritoneal cavity is opened temporarily, and the peritoneum is stripped from below upwards off the upper surface of the bladder and the anterior wall of the uterus. The cervix was then incised transversely, and the child delivered. This was the first attempt at extra-peritoneal section.

In 1908 Latzko and Döderlein devised methods for gaining access to the cervix without opening into the peritoneal cavity at any stage, truly then extra-peritoneal all through. The following is the usual description of the Döderlein, or, as it is sometimes referred to, as the Latzko-Döderlein method:—The bladder is well injected to define its contour.

A transverse incision with separation of the recti and partial detachment of the right rectus near its base. The hand is then introduced to the right of the bladder (which being distended is easily defined), the loose connective tissue separated, by means of which the anterior surface of the lower uterine segment is exposed. There is no detaching of the peritoneum from the bladder.

The head usually pouches the lower uterine segment forwards considerably, and at the top of this part which pouches forwards

a longitudinal incision in made and carried downwards, and delivery effected.

This seems at the present moment to be the method most generally employed on the Continent, and has recently been carried out with approval and success by Russell of Glasgow, by Hastings Tweedy, and other British operators.

An endeavour to cope successfully with cases which the obstetrician believes must be septic has been lately carried out apparently with success, by a manoeuvre suggested by Sellheim. This is to establish a utero-abdominal fistula. Briefly, he opens the abdomen with a longitudinal median incision, stitches the skin to the parietal peritoneum, incises the uterine peritoneum longitudinally, and strips it off the line of the intended uterine incision, sewing it also to the parietal peritoneum. The uterine contents are extracted by a longitudinal incision, the uterus being left open, the edges being stitched to the edges of the abdominal wound, thus establishing a utero-abdominal fistula, which Sellheim maintains contracts rapidly as a rule, and only occasionally requires a subsequent plastic operation.

Having reviewed in brief the most recent methods of continental fashion in the performance of abdominal Cesarean section, where are we? That is the practical point for the obstetric surgeon to face. Are we in cases of contracted pelvis to abandon the time-honoured classical section of the corpus uteri, and instead deliver from the lower uterine segment by some form of extra-peritoneal route? Frank and his train of followers stated that it was to meet the requirements of septic cases that the extra-peritoneal operation was devised, and maintained that its great advantage in all such cases was the prevention of contamination of the peritoneum by infected uterine contents. But has this advantage, enormous as it would have been and meaning the saving of the patient's life, been actually realised? I do not think it has. Another advantage widely claimed for it was that there was less danger of hemorrhage, but every operator experienced in the classical operation knows how seldom is the bleeding formidable.

The extra-peritoneal methods have been by no means free from trouble, and an inquiry into the experiences of different operators substantiates this. Frank himself admitted that in cases where the lower uterine segment had not been extended, hemorrhage had been very considerable, also that detachment of a large area of the peritoneum had caused gangrene.

Hæmorrhage is prone to occur from the vesical veins, and on several occasions has been so severe that the operator was compelled to abandon the extra-peritoneal operation and perform instead the ordinary classical operation. Such has been the experience of Fraipont, Franz, and many others. Kustner also speaks of the difficulty he has encountered in the extraction of the child, and, like some other operators, uses a pair of small forceps for extraction.

Lacerations of the bladder and severe tears of the peritoneum were not infrequent. These, however, appear to have been of less frequency in the Döderlein method.

The mortality of these extra-peritoneal operations has been variously stated. By some it is given as 5 to 7 per cent., but further experience tends to make it higher. The morbidity is about 30 per cent. The fatal cases are generally the result of peritonitis, in spite of the fact that the peritoneal cavity is supposed to be shut off from the operation area.

H. F. Lewis, however, collected 102 cases, and finds the maternal mortality of extra-peritoneal Cæsarean section to be 8.8 per cent. It does not seem to offer a better chance in infected cases than would the classical operation with careful shutting off of the peritoneal cavity.

Sellheim's suggestion of a utero-abdominal fistula should be borne in mind, and worthy, I think, of trial in a really septic case. Routh is convinced that, in a recent case he had, a utero-abdominal fistula was the important factor in saving the patient's life. It seems to me the difficulty in the past has been to be sure of the presence or absence of sepsis, as in some cases the danger signal is not in evidence at the moment when we are called in to decide the course to be followed. There are many cases, I am sure, just on the borderland, and these have been the difficult ones to deal with.

Now, however, there is the hope that a bacteriological examination of intra-uterine swabbings may shortly prove of invaluable help to us in identifying, even within an hour, the presence of such organisms as would deter most of us from performing a Cæsarean section of any kind, and thus place such an important decision on a precisely scientific basis.

Given, then, a case of contracted pelvis where infection is proved, and we refuse abdominal section, craniotomy is the only alternative. Within recent years there has been an outcry against this procedure, and justly so. There are obstetricians

who will not perform it under any circumstances. Pinard is one, and his death-rate in such cases is 20 per cent. Munro Kerr says, with reference to his refusal to perform Cæsarean section in cases which have been interfered with before coming under his notice: "I am compelled, not infrequently, to perforate a living child. It is always with extreme regret, but I am perfectly convinced I save more mothers, and probably indirectly more children." With that I quite agree. We cannot yet make a clean sweep of craniotomy, for the object in performing it in infected cases is that we can empty the uterus of its contents under antiseptic methods, and avoid the development of acute peritonitis from the uterus in a Cæsarean section.

We must bear in mind, however, that in the vast majority of such cases prolonged attempts to deliver by the forceps have been made, and much bruising and laceration of the parts is the result. Add to that some degree of abrasion, while performing the operation, and it is no small wonder that craniotomy performed in already infected cases should have much morbidity and a death-rate of about 10 per cent.

Routh points out, however, that the classical Cæsarean section performed under such circumstances, even within the last ten years, was not less than 34 per cent. The mortality of craniotomy then, performed on infected cases, is very distinctly (nearly 20 per cent.) less than that of Cæsarean section performed under the same circumstances. In the tables presented by Routh it is impressive to note that of 216 cases where attempts at delivery had been made, and where conservative section was done, 40 died, whereas in 14 cases where the uterus was removed by hysterectomy leaving the stump for intra-peritoneal treatment, not one died.

At the present day a panhysterectomy would find favour with some, with the idea that the cervix being septic might be a source of infection, but the risk of infection of the peritoneum from the septic vagina after removal of the uterus is difficult to prevent.

The Production of Adhesions, Accidental or Artificial, and their Effect.—The production of adhesions as the result of a primary Cæsarean section has for long been a source of anxiety to the operator, and has been regarded by some of such serious import as to justify the performance of sterilisation at every Cæsarean section.

Such adhesions have time and again led to disastrous results,

and from various causes. They may be so dense and firm that their separation causes severe bleeding, or the intestines may be wounded or actually perforated during the process, and such complications of course necessitate not only the greatest surgical skill, but they increase—in some cases very considerably—the duration of the operation, and thus transform one of the simplest abdominal operations into one of extreme difficulty and danger.

Not only has one to consider the development of omental and intestinal adhesions, and their dangers, but also those which form naturally between the anterior wall of the uterus and the abdominal wall—the utero-parietal. Experience has taught us that by mere chance adhesions may form between the uterus and the abdominal wall, so firm and so complete that the operator may, at a repeated section, open straight into the uterus, without at any point entering the peritoneal cavity. Both old and modern operators have referred to this utero-parietal adhesion, and many reports of such are to be found in the literature. One of the most remarkable of these was placed on record so long ago as 1836 by Michaelis of Kiel, who performed a Cesarean section for the fourth time on the same patient without entering the peritoneal cavity. The same has been the experience of Sinclair, Wallace, Fruinsholz and Michel, Green, and many others. Various factors, no doubt, are at work in the production of such natural adhesions. Paul Bar said in 1900 that he considered the formation of such adhesions indicated defective asepsis, and believed that with more perfect technique adhesions would disappear.

It is not possible to entertain such a proposition, for we know that mechanical injury, chemical irritation, the mere presence of sterile ligatures, produce within the peritoneal cavity an effusion of lymph, to which any peritoneal surface may become adherent, and in this connection many cases which have undergone a primary section, and have made a perfectly aseptic recovery, have shown evidence of pronounced adhesions at the second or third operation.

Wallace of Liverpool, who published an interesting monograph on "Repeated Cesarean Section," representing a most exhaustive investigation, and calculated to throw much light on the whole subject, deals very specially with the question of adhesions.

Of 60 cases which he collected there were 4 deaths, and all 4 were cases of utero-visceral adhesions.

Recognising that in those cases where a complete utero-parietal adhesion had incidentally formed the operation became simple, easy and safe, Sir William Sinclair attempted to ensure by special procedure the formation of a complete utero-parietal adhesion in every case. He endeavoured to produce this result by rubbing iodoform over the anterior uterine wall, combined with padding and firm bandaging of the abdominal wall.

Other operators had endeavoured to produce utero-parietal adhesion, but not with a view to future pregnancy, their object being solely to prevent leakage from the uterus into the peritoneal cavity.

It was A. J. Wallace of Liverpool who suggested that the most certain way to produce such a utero-parietal adhesion was to fix the uterus by sutures to the abdominal wall. Sinclair and Wallace, in different papers, both describe the details of the technique carried out. Briefly stated, it is an extensive ventrofixation produced after closure of the uterus by a series of sutures introduced through the parietal peritoneum on one side, taking then a grip of the uterine wall about half an inch outside the uterine wound, and then on through the parietal peritoneum on the opposite side of the wound. Sinclair also introduces one or two silk sutures through the fascia and peritoneum, which take a good grip of the uterus and pass out through the peritoneum and fascia on the opposite side. He points out that the production of such a procedure (1st) ensures a wide area of adhesion; (2nd) that it supports the uterus, and prevents its displacement during involution; (3rd) that it excludes omentum and intestine from the field of future operation.

Now if such a utero-parietal adhesion could be invariably relied upon to preclude from the field of future operation omentum and intestine, and if at the same time it were to be followed by no serious consequences during a future pregnancy, it appears to me we should have here—so far as repeated section is concerned—one of the simplest and safest of all the extra-peritoneal operations to perform.

Attempts, however, to produce such an adhesion have met with adverse criticism by many writers, who all refer to the same proposition, viz. that if the anterior uterine wall be fixed, it has little chance of expanding during the growth of pregnancy, and that in consequence the uterine enlargement must necessarily take place in the posterior wall, meaning thereby its thinning and its tendency to rupture—the firmer the adhesion the greater the tendency. Here, however, we may remark that the operator of to-day, when

dealing with a patient still in the child-bearing period, takes care when performing ventrofixation to do so well down the anterior wall, leaving the fundus entirely free to expand if pregnancy supervene.

In Routh's collection of 1282 Cesarean sections I find only six reported to have had a ventrofixation performed, and in subsequent pregnancy no actual rupture occurred, although in one of this series reported by Targett, and one by Jardine, it was evidently threatened. Are we then to abandon the method suggested by Sinclair and Wallace of providing for an extra-peritoneal operation in a future section, as predisposing to rupture and possible strangulation?

Some Points in the Technique of the Ordinary Classical Operation.

—The careful closure of the uterine wound is an absolute essential if one has regard to the influence of a future pregnancy. The older operators never closed the uterus at all, and still many of their patients recovered, often, however, with utero-abdominal fistulae, which, I suggest, was in those days probably their safety-valve, for it will be remembered that one of Sellheim's latest suggestions for septic cases was to create a utero-abdominal fistula. Such, however, must inevitably leave a weak cicatrix, prone to give way under the strain of a future pregnancy. Wallace says: "Not mere healing, but total obliteration of all traces of the wound should be aimed at"; and he advises that three layers of sutures be used. The first, he says, includes decidua and part of the muscular wall. This means that part of the suture lies exposed in the uterine cavity, and to this many operators object. The second layer, he says, should include muscle only; and the third, muscle and peritoneum together. Whatever be the operator's method, it is desirable to cover the deep sutures by overlapping the peritoneal edges.

As regards the suturing, may I here say that I have found for the passing of the deep sutures nothing to equal Doyen's curved uterine needle. It is ideal for this purpose. It is doubtful if it matters very much whether silk, catgut, or linen thread be used. Personally I have used catgut in my own cases. It is Sinclair, however, who strongly advocates silk for the uterine wound, and says: "My belief is that if silk were always employed, we should seldom or never hear of rupture."

As regards the suturing, it seems to me that in including the decidua in the first layer of sutures there is both an advantage and a disadvantage. If one goes right through the entire substance of

the uterine wall, one is more likely to obtain complete union of the entire muscular layer—a most important aim: while, on the other hand, if the contents of the uterus be not aseptic, one here establishes a continuity between decidua and peritoneum, which might quite well be responsible for peritoneal infection. If one is dealing with a presumably aseptic uterus, I am quite convinced one should go right through the whole uterine wall, for by so doing one prevents the inner and deeper edge from retracting, which it is very apt to do. On the other hand, M-Pherson of New York believes it is essential not to include the mucous membrane with the sutures at all, not merely for fear of infection, but also because he believes that the mucosa may become included between the edges of the muscle, and such foci of mucous membrane may in successive pregnancies be transformed by the ordinary method into decidual tissue, thereby leading to separation of the walls and subsequent weakness of the scar, thus allowing the uterus to rupture. In all probability, he says, many ruptures are due to this cause. Now, I admit one cannot deny the possibility of such an occurrence, but so far few cases have been produced to prove it; whereas we have a good many cases recorded in which it was clearly shown that complete union of the muscular layer had never taken place, and I feel disposed to regard the latter as a much more likely predisposing cause of rupture than the former.

The Relation of Repeated Section to Rupture.—The danger of the uterine cicatrix giving way during a future pregnancy or labour is one of the leading arguments of those who are opposed to the performance of repeated Cæsarean section. Both after the transverse fundal incision, as also the longitudinal—median—has the resulting cicatrix given way at a future pregnancy or labour. Thus rupture occurred after the fundal incision in cases recorded by Munro Kerr, Ekstein, Schink, and more recently by Mabbot, Dahlman, Nacke, and Meyer of Copenhagen.

Of a series of 26 cases collected by Dahlman, 13 are said to have followed a transverse scar. On the other hand, Simrock of Bonn records 54 cases performed by Fritsch's transverse incision, of which 3 had the operation performed for the second time, and in these he found a strong cicatrix, with no evidence of thinning of the wall or tendency to rupture. An examination into the literature of scar rupture after Cæsarean section shows that a large number have been placed on record, but it has been disappointing to find the reports lacking in important details. A considerable number of cases are on record following the longitudinal scar on

the anterior wall, and occurring through it. Such are reported by Kobauk, Woyer, Guillaume, Targott, Everke, Galabin, Werth, Schneider, Lobenstine, Brodhead, Brothers, Prüssmann-Henkel, Convelaire.

Richter, Scheffzek, and Jeannin give full reports of recent cases, but in addition to the foregoing there have been other cases, the reports of which are very incomplete.

As regards the exact frequency of the occurrence of rupture in relation to repeated section, reliable statistics have been difficult to obtain. Olshausen, for instance, had only met with one case of rupture in 120 sections.

Convelaire thinks rupture occurs probably in about 2 per cent. of cases, whilst the mortality of repeated section seems to be 5 to 6 per cent. In 150 cases collected by Polak it was only 5 per cent.

The rupture may occur during pregnancy or at the onset of labour, but far more frequently after labour has been in progress for some time.

Of 20 cases collected by Brodhead, it is interesting to note that only in 5 is it definitely stated that rupture occurred before labour had set in. Further, in at least 3 of this series there was evidence at the second Cesarean section to demonstrate that the uterine wound of the previous operation had failed to unite through the entire thickness of its wall. It is quite possible that such a condition of affairs may have been present in other cases of this series, but whether or not, 15 per cent. of uterine wounds found imperfectly healed only goes to prove what I should like to lay stress on, viz. the absolute necessity of spending a little extra time and care in endeavouring to secure perfect coaptation of the uterine surfaces.

I find that Sinclair, Munro Kerr, and Wallace all refer to the importance of this. I feel convinced that if thorough apposition be secured, with a minimum of cicatricial tissue, the cases of rupture will be few to record.

Mason and Williams performed a series of experiments on pregnant animals, the object of which was to ascertain certain parts relative to uterine rupture in pregnancy. They performed Cesarean section on these, and killed them after periods of not less than full-term gestation. They made comparative tests of the muscle and scar respectively, by applying weights to a part of the uterine wall containing both. In every case the muscle gave way first, and in one instance only did the rupture extend secondarily into and along the scar.

Two animals became pregnant for the second time. Cæsarean section was repeated, and near term the test was made again, the result being the same as in those who were not again pregnant, thus ruling out any change in the strength of the scar during pregnancy.

Their conclusion is that a carefully sutured and well united scar will stand any strain which can be endured by the uterine muscle, and they maintain that rupture of a scar is always secondary to unusual weakness of the scar, and dependent upon imperfect consolidation. The most frequent cause of imperfect consolidation is placing the deep sutures too far apart, or not including the entire thickness of the uterine wall, or from infection of the scar.

I do not wish, however, to infer that even after the most careful surgical technique rupture will never occur, but I believe it should be rare. Richter, for instance, recently reported to the Dresden Gynecological Society a case where he said a most thorough repair of the uterine wall had been carried out, and yet rupture occurred at the fourth month of the subsequent pregnancy. This, I should think, must almost be unique at the fourth month. Jeamin and Wilhelm also showed at the Paris Obstetrical Society a uterus which had ruptured at the scar of the previous section. The patient was admitted to hospital in labour, but they believe rupture occurred after admission while she was being prepared for craniotomy. They found no evidence whatever of imperfect union of the uterine wound, nor of thinning of the wall, nor was there even any distension of the uterus. Allowing, then, that such cases do occur even after the most careful technique, there must be some other etiological factor at work.

It was Kaltenbach who first suggested that the cause of rupture depended on the presence of infection of the uterine wound. Certainly in some cases of rupture there was evidence of suppuration having occurred in the wound, with involvement of the uterine cicatrix.

Werth maintains that it must sometimes be due to the rhythmic contractions of the uterus preventing an exact union of the freshly sutured wound surfaces, for in a case in which the most exact suturing was performed, and in which rupture occurred, it was found that only very thin strips of muscle formed the union, appearing as a very thin layer under the peritoneum.

Karl Hartmann refers to a case of rupture where the tear had

caused the edges to become everted, demonstrating, he says, the pull of the muscular fibres.

Sterilisation.—In the absence of absolute indications, as, for *e.g.*, fibroids, malignant disease or sepsis, under what circumstances are we justified in sterilising a woman while performing Cesarean section for pelvic contraction? Few questions, especially from the ethical standpoint, have been the subject of greater controversy than that of sterilisation. Without wishing to be dogmatic, I hold that in the absence of pelvic or other disease, or any indication save the contraction itself, no woman ought to be sterilised, and no operator should encourage such a procedure at the first section. Green, in a paper read before the American Gynecological Society, says: "I am more strongly convinced than ever that it is not justifiable to sterilise a woman even if she and her husband request it." To that statement most of us would, I presume, take exception. I feel strongly tempted, however, to agree with Green in so far as such a statement is made applicable to the first section. The child delivered at the first section may die, as happened 3 weeks afterwards in my repeated case. Now if I had sterilised that patient at her first section, to which she and her husband would have had no objection, the circumstances—no child and being sterilised—would, as I afterwards learned, have caused bitter regret.

I am quite certain that women who desire sterilisation at their first section do so for the most part under an unnatural dread of its performance being repeated. They regard it almost as a tempting of Providence. Now, in view of the evidence which can be led before us to-day relative to repeated sections, which evidence goes to prove that after all the repeated operation is attended by if anything a smaller mortality than the primary, I submit it is the duty of every operator to discourage sterilisation at the first section. At the same time it becomes his imperative duty to point out to every woman and to her husband the absolute necessity of reporting her condition to her doctor during the earlier months of pregnancy. If a woman does not do so, then she deliberately neglects the most important step towards her self-preservation, for which no surgeon can be in the slightest degree responsible. The importance of this cannot be laid down too strongly, for there is abundant evidence to prove that rupture—the dreaded danger—takes place in the vast majority of cases after the onset of labour. Here lies the importance of giving the surgeon the chance of performing an elective Cesarean.

Of 150 cases reported by Polak of New York,

116	had Cæsarean section performed twice,	
32	“ “	thrice,
1	“ “	four times,
2	“ “	five times,

and yet the mortality was only 5 per cent.

McPherson gives satisfactory information regarding thirty-nine repeated Cæsareans and representing 120 operations, with only three deaths.

Such records, I think, are sufficient to satisfy our minds that the repeated operation offers very little increased danger, if any, and a smaller mortality when compared with the primary, and I therefore submit that, except under very special circumstances, it is not the duty of the surgeon to advocate sterilisation to those patients who come under his care for repeated section. Dr. Munro Kerr, who has had an exceptionally extensive experience, having performed up to date close on 90 Cæsareans, says in his *Operative Midwifery*: “It has been my practice up to the present time (1908) to sterilise *all* patients after a second Cæsarean section, for I feel that a woman who has twice subjected herself to Cæsarean section has done sufficient for her family and the State.” Notwithstanding the fact that such an experienced and successful operator should come to this conclusion, I cannot agree with him. I think we are fully justified in performing the operation a third, fourth, or even fifth time, if the patient herself, having had previous experience of the operation, and having the possible dangers laid before her in a fair way, should desire delivery by section. My own patient and her husband urged me at the third section to perform sterilisation, which I did, reluctantly however. I entirely disagree with Green, Herbert Spencer, and others, who maintain that the patient's wishes should not be consulted. I am of opinion that we are fully justified in advising a woman to a third or further Cæsarean section, but under no circumstances justified in refusing to perform sterilisation if she and her husband demand it. This may be performed in a variety of ways, as by ligature of the tube in two places and excision of the intervening portion. This has the possible advantage that if the patient changed her mind and desired another child the divided ends might be reunited and the patency of the tube restored. This ingenious suggestion was made, I think, by Dr. Munro Kerr, but whether he or any other operator has

ever carried it out I do not know. Probably the surest way is to excise thoroughly the tube from the uterine wall.

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AN IMPROVED COLOTOMY TUBE.

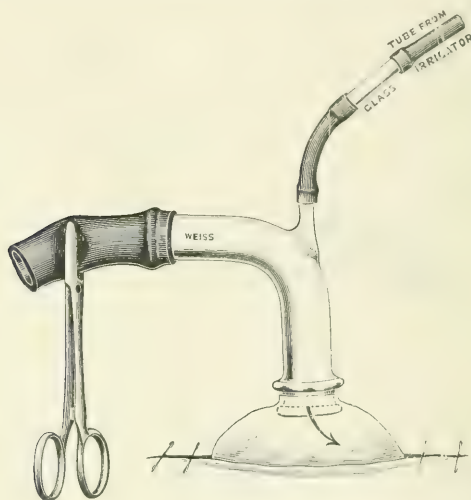
By DUNCAN FITZWILLIAMS, M.D., F.R.C.S.

THE paramount importance of evacuating the septic and highly toxic contents of the bowel with the least possible delay in cases of acute obstruction has long been recognised by all. Unfortunately this is not always an easy matter, and after fixing the ordinary colotomy tube of Paul's pattern into the gut, our attempts to empty the bowel are confined to the giving of aperients by the mouth, and more recently the administration of eserine subcutaneously to stimulate peristalsis. As, however, vomiting may



continue for some hours or even days after the operation, aperients are frequently of little use. The most effective and the quickest method of emptying the bowel is to wash out the contents by means of an enema. This, however, cannot be done with the colotomy tube at present in use. On several occasions I have tried to do this by making a small hole in the large rubber escape tube used to carry off the bowel contents and introducing fluids while the tube is clamped beneath the hole. This has proved unsatisfactory, as leakage occurs subsequently through the hole, and the tube is rendered useless for future use. Some months ago Messrs. Weiss & Son made to my pattern a colotomy tube which avoids those drawbacks and allows the bowel to be flushed without inconvenience. The tube differs from the one in general use in the fact that a small, short arm is inset into the convexity of the curve, so that it has the same direction as the limb of the tube

which is inserted into the bowel. When in use a small piece of drainage tube about 6 ins. long is fitted on to the short arm. After the tube is fastened into the bowel the end of the drainage tube will project above the dressings, and must be secured to prevent the escape of bowel contents. This may be done with a pair of clip forceps or a safety pin attached to the binder, or the tube may be tied in a simple knot. After the first gush of fæcal material has passed, the interior of the bowel can be washed out by means of a douche can or an enema syringe, the fluid being led through the small rubber tube into the interior of the colotomy



tube. The large escape tube is flushed out and then clamped, after which the fluid enters the bowel.

In this way enemata can be given at short intervals without disturbing or soiling the dressings. The ordinary enemata can be employed, but if an irritant such as turpentine is used only half the usual strength should be given, on account of the inflamed state of the bowel.

Another great advantage is that after the bowel is cleared, which can be done usually in about six hours, fluids such as warm saline can be given in the same manner as is employed in septic peritonitis. It is rapidly absorbed, and is useful in replacing the amount of fluid lost by the previous vomiting.

If the vomiting has been present for some days another element antagonistic to the patient has to be reckoned with, namely, actual starvation, as nothing taken by the mouth has been

retained in the stomach; for this reason it is a good plan to add to the saline sufficient glucose to make a 2 per cent. solution. This can be absorbed directly into the blood and used as a food.

I have used these tubes on more than a dozen cases, and find them a great advance on the old ones, which serve merely as an outlet for the bowel contents.

The tubes are made in four sizes, ranging in diameter from half an inch to an inch and a quarter.

CLINICAL RECORDS.

AN ACCOUNT OF AN OPERATION FOR APPENDICITIS
PERFORMED ON THE HIGH SEAS.

By G. HUNTLY WOOD, M.B.,
New Zealand.

ON 6th May 1911 the S.S. *Narrung*, an Australian emigrant ship of an old type and full of passengers, was *en route* from Cape Town to Adelaide, South Australia, twelve days out from the Cape and nine days' steaming distance from her destination.

The third officer, whom I had seen at dinner at 7 P.M., and who was then quite well, went on the bridge at 8 P.M. to take the 8 to 12 watch. At 8.30 P.M. he was suddenly seized with pain all over the abdomen, not bad at first, but gradually becoming worse. He felt giddy, had nausea, but did not vomit. At 10 o'clock he was relieved from duty, and I was asked to see him. His face was grey and drawn with pain, and realising that he was seriously ill I desired that he should be put to bed at once, and then proceeded to examine him.

He was a robust, bronzed seaman, 24 years of age, had had yellow fever in Callao nine years before, dysentery in Cape Town two years before, and ptomaine poisoning at sea nine months before. He suffered from pyorrhœa alveolaris, and was the subject of habitual constipation. He complained of pain all over the abdomen and in the right loin. The pain, he stated, was worse than that of ptomaine poisoning. His face was drawn with pain, pulse 98, temperature 98° F. There was *marked general rigidity* of the abdomen, with slight distension. Tenderness was present, slight in the left iliac fossa but marked in the right iliac region, and he placed the tip of one finger directly on McBurney's point to indicate the tenderest spot. There was no dulness. He begged for morphia, but I told him that he had acute appendicitis, and that I must watch his progress without any masking of symptoms. I applied flannels wrung out of boiling water to the abdomen, changing them every fifteen minutes, and gave sips of water to allay thirst.

Progress.—At 10.45 P.M. he passed urine, the act causing him much pain. At midnight the pain was somewhat easier, and more definitely on the right side—pulse 74. At 2 A.M. pulse 68, temperature 98° F. He complained of pain entirely localised in appendix region—"the worst pain he had ever had." Rigidity and tenderness were very marked, and now entirely restricted to the appendicular area. In spite of the regular pulse and absence of temperature, and despite also the very grave lack of facilities for operating single handed on the steamer, I decided, having regard to the severity of the attack, and especially to the *difficulty of prognosis*, to operate, and at once. I called the

captain, told him what I desired to be got ready; the orders were given, and promptly and efficiently carried out. The carpenter was turned out to clear away tables and chairs in the dining-room and to bolt down tables where I required them; the chief steward to provide towels, blankets, and bowls; the engineer to rig overhead lights and portables; the chief cook to make up the galley fire and provide unlimited boiling water; the bos'un and the watch to move the patient along, using a bulkhead door as a stretcher. The emigrants' dining-room, though probably the most germ-laden compartment in the ship, was also the only one large enough for my purpose. For mops I cut up 20 squares of white surgeon's lint. The instruments were tied up in one towel, the mops in another, and put in a fish-kettle to boil for twenty minutes.

The ship was then in latitude 42° S., longitude 90° E., the "Roaring Forties." The wind at N.N.W., 18' per hour, temperature 50°, with a heavy, raw, drizzling rain blowing across the decks, over which the patient had to be brought. The sea was N.N.W. moderate, but there was also a S.W. swell, height of waves six feet, causing the ship to roll 7-10° either way, with an occasional heavier lurch. The captain decided that the ship would be most steady if kept going at full speed, the vibration caused by the engines not being more than to make one's hand shake slightly in the act of writing.

At 3 A.M. I gave $\frac{1}{4}$ gr. morphia hypodermically, and ten minutes later commenced the anæsthetic—chloroform on a Schimmelbusch's mask, Captain Millington acting as anæsthetist. Just as I desired the anæsthetic to be changed to open ether the patient stopped breathing, and artificial respiration had to be resorted to for some minutes. When respiration was re-established ether by the open method was used, and owing to the skill of the captain in administering it I had no further anxiety, the patient breathing regularly and deeply throughout.

The chief and second stewards and the apprentice were in attendance, to hold the portable lamps and to steady the patient and bowls when the ship gave an extra lurch.

The skin was shaved and cleansed with 1:20 carbolic, a piece of lint soaked in that solution being left on until the incision was made. The operation area was surrounded by boiled towels rung out of 1:20 carbolic; the instruments and mops were laid out on the towels in which they had been boiled. My hands were scrubbed with hot water and soap (I had neither turpentine nor spirit), then with 1:1000 corrosive sublimate. Boiled rubber gloves were worn, and rinsed frequently during the operation in 1:10,000 corrosive. The ligature and suture material was No. 5 chromic catgut, and silkworm catgut, preserved in absolute alcohol. An incision 6 inches in length was made in the usual place. On opening the peritoneum the omentum, as "abdominal policeman," presented itself, the cæcum lying immedi-

ately beneath. Tracing it down, the appendix was found, as expected, hanging over the pelvic brim. It was amputated, the stump being tied, invaginated, and the cæcum closed over it by a purse-string suture of No. 5 chromic gut, a few over-all "preventer" stitches being added for greater security. The vessels of the appendix were ligated with the same material. These were the only vessels tied, those in the belly wall being secured by torsion. The gut was returned very gently, the omentum carefully drawn over it, and the belly wall closed in layers, the peritoneum by a continuous catgut suture, the muscular layers by interrupted sutures, and the skin by interrupted silkworm gut suture, each suture picking up the superficial muscles. The wound was dressed with a towel wrung out of 1:1000 corrosive, covered with all the wool I possessed, and firmly bandaged. The patient had to be carried through the cold wind and rain over the upper deck to my cabin, which was on the upper deck, and where my bed had been prepared. He was wrapped in blankets, and surrounded with a dozen whisky bottles filled with hot water. I had, of course, to undertake myself the nursing and after-treatment, which was as nearly as possible on the lines of that carried out in the surgical wards of the Royal Victoria Infirmary, viz.:—sips of water for first twelve hours, milk and barley water in teaspoonful doses for the next few hours, then rapidly increased until patient helped himself. Morphia (gr. $\frac{1}{4}$) was given on the first night for pain, castor oil on the second night, followed by a soap and water enema. After this the patient was allowed to eat and drink what he fancied, to smoke when he liked, and to adopt any position he preferred. He lived practically in the open air, my cabin being on the upper deck, and door, port-holes, and ventilator were kept wide open night and day. He made a rapid, uninterrupted, and uneventful recovery, the wound healing kindly, "under a single dressing, and without pain or constitutional disturbance," the pulse and temperature never rising above 72 and 99° F. respectively.

The appendix showed the following pathology:—It is $3\frac{1}{2}$ ins. in length—the proximal $\frac{3}{4}$ in. and distal $\frac{3}{4}$ in. appear to be normal. At $\frac{3}{4}$ in. from the base there is a slight constriction, and just beyond there is a bulging. The appendix between the two terminal areas is acutely inflamed, the vessels on the surface being engorged and congested. The bulging is bluish-brown in colour, this discoloration gradually fading into normal at the tip. On making a section of the appendix the middle two-thirds contain fæces, and the mucous membrane is acutely inflamed. At the site of the slight stricture above mentioned the appendicular wall is thickened, hence the wall thins rapidly to the point of bulging where there is an ulcer $\frac{1}{4}$ in. in diameter which has eroded the mucous and muscular walls, the floor of the ulcer being formed of thickened peritoneum only.

I submit the following comments on the case:—

The advantage and necessity of an early operation were justified by the pathology of the appendix. It would have perforated in a very few hours.

The exemplification of the success of the very simple antiseptic technique which I was taught and saw continually practised by my teachers, the surgeons of the Royal Victoria Infirmary, Newcastle-on-Tyne.

Having to operate single handed is not a bar to *emergency* surgery.

The comparative safety of open ether, even in untrained hands. I had no anxiety while *this* anæsthetic was being administered, never looked at the patient's face, being constantly reassured by the loud, steady, and regular breathing.

The patient's rectum was loaded with inspissated feces, and he suffered from oral sepsis. May not these factors conduce to the determination of an appendicular attack?

A CASE OF GOUT.

By J. EASON, M.D., F.R.C.P.,
Physician, Leith Hospital.

AMONGST the working classes in Scotland it is uncommon to meet with indications of frank gout. A case of this kind is at present under observation at Leith Hospital, and the facts regarding it seem worth putting on record.

J. T., male, aged 70, a widower, was born in Orkney and has always lived in Scotland. He is in poor circumstances, and during a previous illness he was an inmate of the Parish Hospital of South Leith. Since coming to Edinburgh at the age of 28 he has been employed as a railway porter. He had previously worked on a farm in Westray, where he was allowed home-brewed ale and "plenty of it." At a later period he worked for five years in a hotel, and he was in the habit of drinking beer to dinner and at odd times. After coming to Edinburgh he continued to indulge freely in beer drinking, but "never took much whisky." It has been impossible to gather more precise information as to the daily consumption of beer, but that he indulged somewhat freely his fondness for it is tolerably certain. Of his antecedents he knows very little, and he does not know if there has been gout in his family. His father was an Englishman, and by occupation a butler.

Twenty years ago J. T. had smallpox, and he has had bronchitis on several occasions. About 14 years ago he began to have attacks characterised by swelling, redness, and pain in the joints of his toes.

About a year later his hands became similarly affected. Ten years ago, after a paroxysm which involved the first interphalangeal joint of the middle finger of the left hand, he observed that the swelling remained, and there were "two white knobs in it." From that time to the present day he has been subject to attacks, some of which are very painful and others practically painless. Many of these have been accompanied or followed by the appearance of more white "knobs."

Present Condition.—He is a spare man. His complexion is sallow. His nose is typical of chronic alcoholism, and the conjunctivæ are slightly jaundiced. There is some œdema of the legs.

About the elbows, wrists, finger and toe joints, and in many of the tendon sheaths of the hands and feet, there are numerous rounded protuberances which in a striking manner resemble the lesions of xanthoma. These are covered by attenuated and very transparent skin, and are of semi-solid or solid consistence. Their colour is creamy white. The deposits vary greatly in size. The majority in the tendon sheaths are small and flattened. Around the joints they are larger, and one situated over the right olecranon is the size of a golf ball.

The first interphalangeal joint of one of the fingers is at present greatly enlarged, inflamed, and tense, and deposits show through the attenuated skin at many points.

Since he entered hospital the contents of two of the swellings have ulcerated through the skin. On examination the extruded matter was found to have the consistence, colour, and general appearance of putty, but was slightly more glistening. Dr. Cramer kindly made for me a chemical examination of the deposits. He has reported that they chiefly consist of sodium biurate and organic matter.

When admitted to hospital it was observed that the patient had considerable ascites, and the abdomen was tapped on several occasions. After tapping it was found that both liver and spleen were much enlarged. The vertical measurement of the liver was 8 ins. and the spleen measured $11\frac{1}{2}$ ins. in its long axis. Palpation of the spleen proved it to be exceedingly firm in consistence.

Blood.—R.B.C. 2,350,000; H. 40 per cent.; W.B.C. 8500 to 10,000 by various counts. The differential count gave fairly normal proportions.

There was usually some albumin in the urine, varying in amount from a mere trace to 12 grs. No casts have been found. The urea has always been subnormal, the highest amount being 200 grs., and the lowest 115. The uric acid excretion has been estimated on nine occasions by the Folin-Schaffer method, and the amount excreted per diem has varied from .01 to .7 grms. Six of the nine estimations have given subnormal amounts, while on one occasion the excretion was more than double the normal average .3 grms. On one occasion there was a

"cayenne-pepper" sediment in the urine. There is no pus, blood, sugar, or bile in the urine. At no time has he suffered from pain in the kidney region or bladder.

The tongue is slightly furred, and the bowel movements are frequent and the stools watery.

The heart sounds are normal, and the peripheral vessels are thickened and tortuous. The systolic manometric reading is 130 mm. Hg.

The chief points of interest in this case are (1) the history of the patient's almost life-long predilection for beer; and (2) the unusual severity of the symptoms in the case of a working man living in this part of the country; (3) the coincident nephritic symptoms which Sir William Roberts regarded as the special feature of hospital cases in England.

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A CASE OF PARAFFIN EPITHELIOMA OCCURRING ON THE NECK.

By ALEXANDER MILES, F.R.C.S.,
Surgeon, Royal Infirmary.

THE clinical appearances in the case here reported so closely resembled those of paraffin epithelioma as it occurs on the hands and forearms of paraffin workers that this possibility was at once suggested. On inquiry it was found that the patient in the course of his occupation carried on his shoulders railway sleepers which had been soaked in tar. It seems highly probable that the development of the cancerous growth was associated with irritation of the skin by tar from the sleepers.

The patient was a man of 70, who, until a year before, had been employed as a plate-layer on the railway. He was sent to the Royal Infirmary by Dr. Watson of East Wemyss with a view to having an ulcer removed from the side of his neck, as it presented characters suggestive of malignant disease. On the right side of the neck, a little below the level of the angle of the jaw, was an irregular ulcerated area about three inches long by two broad. The surface, which projected about half an inch beyond the level of the surrounding skin, was nodular, and exuded a quantity of serous fluid mixed with blood. The edges, which were densely indurated, rose abruptly from the surrounding skin and rolled outwards so that they overlapped the surrounding skin. The ulcer lay over the sterno-mastoid but was not attached in any way to the muscle, and it could be picked up from the deep fascia and moved in all directions. Scattered over the side of the neck were numerous scaly patches, which at once suggested a resemblance to the form of paraffin eczema frequently seen on the hands and forearms of paraffin workers. On the left side of the neck

at a corresponding level was a hard nodular swelling, about the size of a horse-bean, in the substance of the skin. It had not ulcerated, and was freely movable. There was no palpable enlargement of the lymph glands.

The patient told us that he first noticed a pimple on the right side of the neck a little more than two years before. It persisted for a considerable time, but caused him no discomfort until the head was knocked off it while he was carrying railway sleepers on his shoulder. After this it increased in size and projected further from the skin. A watery discharge oozed from the broken surface and formed a scab, which, however, was constantly being knocked off in the course of his work, and this was attended with some bleeding. By the end of a year from the time the surface broke it had increased so that he could no longer wear a collar with comfort. Within the last six months it had increased in size more rapidly than before.

The nodule on the left side of the neck appeared about four months before the patient came to the Infirmary.

The patient's father died of "cancer" at the age of 70, and his mother of "heart disease" at the age of 82—another illustration of Mr. Annandale's observation that the forebears of cancerous subjects are usually long-lived.

The ulcerated area on the right side and the nodule on the left were freely excised. The specimens were examined by Dr. James Miller, who reports:—

Microscopical Appearances—Larger Tumour.—In the region of the growth there is well-marked invasion of the subepithelial fibrous tissue by tongues and masses of squamous epithelium. The cells composing these are, as a rule, large, with intercellular bridges joining them. There is a well-marked tendency to keratinisation giving rise to the formation of typical cell nests. The nuclei of the cells are also large, in some cases multiple. Mitotic figures are few in number. The tissue around the invading epithelium is very cellular, the cells being chiefly of the small, round, or lymphoid type. The microscopic appearances are, to put them shortly, those found in an ordinary squamous epithelioma of the skin.

Smaller Growth.—In this case there is also well-marked invasion of the epithelial cells into the subepithelial tissues. The cells are, however, much smaller in size, and more spindle-shaped. There is no tendency to keratinisation in the centre of the epithelial masses, and therefore no cell nests. There is a distinct cellular reaction in the tissues around. The appearances are, on the whole, more like what one finds in rodent ulcers.

MEETINGS OF SOCIETIES.

Edinburgh Medico-Chirurgical Society.

THE first meeting for the session was held on 1st November. Mr. J. M. Cotterill was elected President, and Mr. Miles and Dr. J. S. Fowler were appointed Secretaries.

Dr. Norman Walker showed a case of antipyrin rash of five years' duration in a patient who had been taking powders containing antipyrin for megrim. The rash consisted of rounded patches, some as large as a penny, chiefly in the region of the hips. There was considerable itchiness and slight thickening.

Sir Thomas Fraser showed a case of syringomyelia with unilateral hyperhidrosis. Patient was a man aged 22, who had spastic paralysis, chiefly affecting the left leg. Tactile sense was unimpaired but there was great loss of sensibility to temperature and pain. The affected area was fairly symmetrical. Excessive sweating frequently occurred on the right half of the scalp, face, and neck, while the left side appeared quite dry. The hyperhidrosis was readily induced by mental excitement, and pilocarpine caused sweating over these parts many minutes before it appeared on the other side or elsewhere in the body.

Major Marshall showed a case after short circuiting for chronic tropical dysentery. Professor Alexis Thomson had first performed appendicostomy. Some improvement followed, but the patient was still unable for work. Ileosigmoidostomy was performed six months later and the symptoms rapidly disappeared.

Mr. J. M. Graham (for Professor Alexis Thomson) showed a case of ulcerative colitis for which appendicostomy had been performed. There was great improvement but irrigation had remained necessary, and in view of the success of the previous case it was a question whether a short circuit might not be a more desirable procedure in such cases.

Dr. Byrom Bramwell, the retiring President, then gave his valedictory address, in the course of which he reviewed the work of the Society in the previous two years. He referred to the unusually long obituary list and paid a warm tribute to the memory of several distinguished corresponding and ordinary members. On the motion of Sir James Affleck and Dr. James Ritchie a hearty vote of thanks was accorded to Dr. Bramwell for his address and his services to the Society.

Dr. Byrom Bramwell and Professor Alexis Thomson then contributed a paper on a "Case of Tabes with Severe Gastric Crises of

Many Years' Duration," in which section of the posterior nerve roots had produced benefit. Tabes had commenced 10 months after a chancre. Gastric crises were among the early symptoms. Blindness supervened within a year after symptoms of tabes began. There was no remission of other symptoms, and Charcot's joint symptoms became prominent. As the patient was never free from gastric attacks for more than nine weeks, the seventh to the tenth dorsal roots were divided. There was no return of the gastric symptoms. The lightning pains lessened and there was slight improvement in the gait. Dr. G. A. Gibson said he was glad to hear of such a good result in this case, since he held that the sympathetic fibres passed out by the grey rami and not by the white rami as was usually taught. Dr. Edwin Bramwell expressed the view that such an operation must only be considered in very extreme cases such as the one described, in which one would be glad to try anything which might give relief.

Forfarshire Medical Association.

A MEETING of the Forfarshire Medical Association was held in University College, on Thursday, 9th October. Dr. Angus MacGillivray occupied the chair. Four new members were admitted to the Association.

Dr. J. Mackie Whyte read a paper entitled "Notes on Two Cases of Hepatic Cirrhosis." The first was that of a young man with a history of alcoholism and syphilis. On three different occasions he had been under treatment for attacks of hæmatemesis during two years. There were no dyspeptic symptoms throughout and there was no ascites. The liver was cirrhotic and spleen enlarged. In October a severe hæmatemesis proved rapidly fatal. Blood examinations had been performed. Post-mortem there was found multilobular cirrhosis of the liver, with a spleen weighing 24 ozs. An œsophageal varix with a small ulcer was discovered. The second case was that of a girl of 17 years who had had coeliotomy performed several years previously for some obscure condition suggestive of tuberculous peritonitis. No definite cause was then discovered, but the patient had been well until her last illness, which commenced with rather vague symptoms but had terminated suddenly after an acute illness of three days. At the autopsy cirrhosis of the liver was confirmed and the spleen was found to weigh 18 ozs. There was no appearance of tuberculosis. Dr. Whyte in his criticism of the cases thought that they could not be classified as cases of Banti's disease, but preferred to regard them as cases of hepatic cirrhosis with splenomegaly.

Professor Stalker, Dr. Milne, and Dr. Kerr took part in the subsequent discussion.

Mr. A. Don showed a patient on whom he had operated for "sarcoma of the nose and base of the brain." He also read notes on "A Case of Squamous-Celled Carcinoma of the Intra-Nasal Septum," in which recurrence had taken place with death ten months after operation, and for fuller details of such cases he referred to the *Edinburgh Medical Journal* for October 1911. Mr. Don also showed chemical indicators for sterilisers.

Dr. Milne gave a demonstration of microscopic slides from a series of five cases of malaria removed to hospital from a steamer which arrived at Dundee from America in October. Four cases showed æstivo-autumnal forms and one the benign tertian.

RECENT LITERATURE.

CRITICAL SUMMARIES AND ABSTRACTS.

MEDICINE.

By W. T. RITCHIE, M.D., F.R.C.P.,
Assistant-Physician to the Royal Infirmary.

THE EXAMINATION OF THE HEART AND AORTA BY MEANS OF THE RÖNTGEN RAYS.

THE ordinary method of Röntgen-ray examination, although useful for the detection of intra-thoracic aneurysms, is of comparatively little assistance in the investigation of the heart itself. We can observe the form of the organ but cannot determine its size easily and accurately, because, the rays being divergent, the shadow of the heart is magnified in proportion to the distance of the tube from the heart and of the latter from the fluorescent screen or photographic plate. For the determination of the true form and size of the heart we have now two methods at our command - orthodiagraphy and teleröntgenography. By both methods the faulty enlargement and distortion of the heart's shadow is almost, if not wholly, obviated. Orthodiagraphy is the older method. It has rendered good service and is still employed. Teleröntgenography of the heart, though still in its infancy, has many advantages over orthodiagraphy, and is already replacing the latter.

Orthodiagraphy.—The orthodiagraph, designed by Moritz in 1900 and subsequently modified by Levy-Dorn and by Groedel, is constructed on the principle that a writing pen, the centre of the anti-cathode, and the opaque central point of a small fluorescent screen are all mounted in line upon the arms of a U shaped frame, which can be moved at will in one plane at a right angle to that line. A small

diaphragm is attached in front of the tube, and the small pencil of rays is moved through parallel positions around the borders of the heart. The movements are observed on the screen, and the pen records the outline upon a sheet of paper. The outline thus obtained is not a magnified one, but corresponds closely to that of the heart.

The outline of a normal heart, recorded by the orthodiagraph, presents two curves on the right and four on the left side. The lower right curve is formed by the right auricle. Above it is the curve of the superior vena cava or ascending part of the aortic arch. On the left side the curves from below upwards are formed (1) by the left ventricle, (2) the left auricle, (3) the pulmonary artery, and (4) the aortic arch and first part of the descending thoracic aorta. In health the left auricular curve is not infrequently indistinguishable.

The orthodiagram may be compared with the percussion outline of the heart. In some instances the findings obtained by the two methods agree closely. Claytor and Merrill say that the percussion outline of the left border is usually found to be correct, but that it is more difficult to locate accurately the right border by percussion than by orthodiagraphy. Other observers, however, find it easier to determine the right border than the left. The percussion outline of a normal heart is more likely to be correct than that of an enlarged heart. In the case of the latter the percussion border is not infrequently well outside the orthodiagraphic outline.

The orthodiagram affords an opportunity for accurate measurement of the heart. Four measurements are usually taken—(1) The long diameter (L.D.) from the right auriculo-venous junction to the apex. (2) M.R., the maximum distance of the right border from the mesial line. (3) M.L., the maximum distance of the left border from the mesial line. (4) The transverse diameter (T.D.) representing the sum of M.R. and M.L. According to Groedel the average figures for the adult male are M.R., 4.6; M.L., 8.4; T.D., 13.0; L.D., 14.0 cm. There is no constant ratio between the size of the heart and that of the body, but the ratio between the heart's size and the body weight is decidedly more constant. As a standard for the normal size of any individual's heart, Levy-Dorn and Möller take certain measurements from his right fist—(a) from the ulnar side of the metacarpophalangeal joint of the little finger to the dorsal surface of the interphalangeal joint of the thumb; and (b) the sum of the hand's-breadth and the length of the first phalanx of the middle finger. The figure obtained by either of these methods is on an average 1 cm. more than the length of the normal heart. These methods should be useful in determining minor degrees of cardiac enlargement unassociated with valvular disease.

The different valvular lesions are usually associated with more or less definite changes in the form of the orthodiagram. According to

Claytor and Merrill, the position of the heart in aortic insufficiency is oblique, both diameters are increased, the right auricular and the pulmonary curves are both prominent. In "pure mitral stenosis" the figure of the heart is more vertical, the right upper curve and the left auricular curve are both pronounced. In mitral incompetence the outline is unduly globular. Van Zwaluwenberg and Warren regard an increase of the auriculo-ventricular index above 0.880 as indicating auricular enlargement and highly suggestive of mitral disease, whereas an index decidedly below the normal (0.534 to 0.704) indicates ventricular enlargement and possibly aortic disease. Orthodiagrams from cases of congenital heart disease have been recorded by Th. and F. M. Groedel. They find that in cases of uncomplicated patency of the foramen ovale and of pulmonary stenosis the heart's outline is of normal form and size. Patency of the ventricular septum is not associated with any departure from the normal form or size, but is characterised by strong pumping movements of the right border of the heart synchronous with those of the left ventricle. Both congenital aortic stenosis and patent ductus arteriosus are associated with an excessive enlargement and marked pulsation of the pulmonary artery. In the latter affection, however, the heart's outline conforms to the vertical position associated with mitral disease, whereas in congenital aortic stenosis it is more horizontal and cylindrical.

Orthodiagraphy of the aorta is regarded by Vaquez and Bordet as a most useful clinical method. On dorso-ventral illumination the semi-circular shadow of the aorta can be studied. It is inconspicuous in children and adolescents, distinct in adults, and pronounced in old persons. The shadow should not project above the lower margin of the sternoclavicular articulation, and its maximum vertical measurement in the healthy adult should not exceed 2 to 3 cm. More information regarding the aorta is obtained when the patient is placed in an oblique position. According to Vaquez and Bordet, the most favourable position is that in which the patient is turned 45° to 60° to the left, keeping his right shoulder in contact with the screen. The clear retro-cardiac space now becomes evident, and the finger-like shadow of the ascending aorta is seen rising up from that of the heart. At 60° one obtains the most favourable view of the descending thoracic aorta and of the summit of the aortic arch. It is with the patient in this position that any fusiform dilatation or saccular aneurysms of the aorta can be distinguished most easily. The diameter and circumference of the aortic shadow may be estimated both on dorso-ventral illumination and at 60° , and the measurements compared with the normal average for the person's age and sex. From the table of figures given by Vaquez and Bordet it appears that the circumference of the aorta enlarges as the age of the subject increases—an observation that is in agreement with the post-mortem findings of Iwakichi Kani. There is a

physiological increase in the degree of aortic pulsation after the age of sixty, when the elasticity of the aortic wall is diminished; but any marked atheromatous thickening is attended with diminution of pulsatile movement. The depth of the aortic shadow depends less upon the diameter of the aorta than upon the state of its wall. The shadow is denser in old than in young persons. A thick aortic wall, especially if it be calcified, casts a deep shadow, whereas the shadow of a dilated aorta with thin walls yields a fainter shadow.

In order to study the aorta to best advantage, the oblique position recommended by Rösler is 45° to the right, with the left shoulder touching the screen. In our experience this position, which is the reverse of that advocated by Vaquez and Bordet, is the most favourable. The illustrations accompanying Rösler's paper show that with the patient in this position the normal thoracic aorta is almost invisible. All that is seen is a faint shadow of the arch between the 6th and 7th ribs. If the aorta be the seat of pathological changes, however, the appearances are altered. The arch becomes more evident, it projects above the sternoclavicular articulation, and the descending thoracic aorta becomes visible in front of the vertebrae. Aneurysms in this situation, which may not reveal themselves by any physical signs, are now easily seen.

In the differential diagnosis of aortic aneurysm from mediastinal tumour the importance of making a thorough screen-examination with the patient in various oblique positions, before proceeding to radiography, is emphasised by Bécélère. If two photographs are afterwards taken at right angles to each other the risk of error in diagnosis is greatly diminished.

The limitations, defects, and risks of orthodiagraphy are discussed by Schmincke. He maintains that even after years of practice it is not possible to obtain two successive orthodiagrams exactly alike from the same heart. The discrepancies in the two records are due mainly to the respiratory movements of the diaphragm, which continually alter the position of the heart, and to a lesser extent to the pulsations of the heart. The duration of each diastolic pause is so brief that it is practically impossible always to draw the same outline of the actively moving apex. The orthodiagraphic differentiation of the right border from shadows of pulmonary or arterial origin is much less exact than that by means of the photograph; and, moreover, orthodiagraphy is not unattended with risk both to the patient and to the observer.

Instantaneous teleröntgenography is clearly the ideal method. Albers-Schönberg, who discusses the technique, says that a satisfactory teleröntgenogram, taken with an instantaneous exposure of about one-tenth of a second and at a distance of not less than 1½ metres, can be obtained with the greatest certainty. The line of the heart's

contour is perfectly sharp, and the minutest details of the lung structure, the bronchi, the vessels, and the glands at the root of the lung are shown. The plate permits an exact measurement of the heart. The maximum correction for the distortion due to projection is 1.4 mm. for the left ventricle. The teleröntgenogram is more accurate and true to life than the older orthodiagram. The difference between the two is comparable to that between an old silhouette and a modern photograph of a face.

The cinematographic reproduction of the heart's movements and pulsations is still far from being perfect. The difficulties are discussed in a paper by Weber. That Röntgen cinematographic studies, however, are already yielding fruit is brought out by F. M. Groedel's researches upon the influence of respiration on the position and size of the heart.

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SURGERY.

By J. W. STRUTHERS, F.R.C.S.,
Assistant Surgeon, Royal Infirmary.

THE TREATMENT OF ANGIOSCLEROTIC GANGRENE OF THE LOWER LIMB BY ARTERIOVENOUS ANASTOMOSIS.

GLASSTEIN (*Berlin. klin. Wochenschr.*, 1911, No. 41) records a case in which the occurrence of gangrene was warded off by anastomosis of the femoral artery and vein. The patient was a man 38 years of age, whose left leg had been amputated three years before for gangrene of the foot. He came under Glasstein's observation complaining of pain and tenderness in the right leg and foot. The skin of the foot and lower third of the leg was dark blue in colour, shiny, and slightly oedematous. At the base of the great toe two reddish-blue spots were present, while no pulsation could be felt in the popliteal, posterior tibial, and dorsalis pedis arteries. Morphia had to be used twice daily to control the pain.

Operation was undertaken in the hope of saving the limb. The

femoral artery and vein were isolated below the origin of the profunda femoris, in Scarpa's triangle, and divided. The central end of the artery was united by circular suture to the peripheral end of the vein, and the peripheral end of the artery and the proximal end of the vein occluded by ligatures. After removing the clamps slight leakage occurred, which was easily arrested by the insertion of two extra stitches. The wound was closed without drainage. The result of the operation was most satisfactory. The foot and leg gradually took on a more normal appearance, and the pain became less. A month after the operation all pain was gone and the patient began to walk. Three months after operation the limb appeared a normal colour and free movements at all the joints could be carried out. When last seen, five months after operation, the patient had complete use of his leg and foot, and the limb appeared perfectly sound. Monod and Vauverts record 26 cases of arteriovenous anastomosis, 16 in cases of established gangrene, 10 in cases of threatened gangrene. In only one case of established gangrene was a successful result obtained, inasmuch as the process was arrested and the rest of the foot took on a normal appearance again. In 10 cases of threatened gangrene 2 successful results were obtained. It is evident from the records that the prospects of success attending the operation are far from bright, and unfortunately it does not appear how the altered circulatory conditions affect the prospects of the amputation, which must be done when the arteriovenous anastomosis fails to arrest or ward off gangrene. Information on this point is necessary before a just estimate of the risks attending femoral arteriovenous anastomosis can be formed.

SUCCESSFUL LIGATION OF THE FIRST PART OF THE LEFT SUBCLAVIAN ARTERY.

Neff (*Annals of Surgery*, October 1911), in doing an extensive operation for the removal of glands in the neck in an adult male 23 years of age, made a minute opening in the subclavian artery just under cover of the scalenus anticus muscle. The opening was closed by applying hæmostatic forceps, which were left on for 48 hours. Suppuration took place in the wound, and repeated secondary hæmorrhages occurred in the course of the first eighteen days following the operation, so that the patient's condition became extremely critical. Gauze packing was used to exercise pressure on the artery after the forceps were removed. On the 18th day ligation of the first part of the subclavian was carried out. The clavicle was divided $1\frac{1}{4}$ ins. from the sternum and well retracted. The sternomastoid and scalenus anticus were divided and the artery carefully cleared. It was found that the arterial wall close to the wound would not hold a ligature, it was so friable, and eventually the ligature had to be placed about

$\frac{3}{4}$ of an inch from the aorta. Silk was used and applied so as to occlude the artery and check pulsation without bruising. The thyroid axis, vertebral and internal mammary arteries were also tied. The patient made a slow but satisfactory recovery. The radial pulse was arrested by the operation and was still imperceptible 16 months later. The upper limb remained warm, and there was no threatening of gangrene. Marked atrophy occurred, however, in the arm, forearm, and hand, along with sensory disturbance. Under treatment this improved until the condition became normal, except for insensibility about the tips of the fingers. A summary of the recorded cases and a discussion of the anatomy of the parts concerned accompany the record.

FÖRSTER'S OPERATION FOR THE GASTRIC CRISES OF TABES.

Zinn (*Berlin. klin. Wochenschr.*, 1911, No. 48) records a successful operation for gastric crises. The patient was a man, 43 years of age, suffering from tabes of four years' duration. Marked ataxia, lightning pains in the legs with absence of reflexes, were present, and for two years he had suffered from increasingly severe gastric crises with severe pain in the stomach region and in the side. Owing to the persistence of vomiting and pain his general condition became critical. No medicinal treatment was of any avail, and operation was advised and performed by Dr. Mühsam.

The roots of the 5th-10th dorsal nerves were exposed and 1 cm. excised from the posterior root of each nerve on each side. The operation was well borne, and the gastric crises stopped immediately after it. The lightning pains in the legs were also to some extent relieved. For five months the patient remained free from gastric trouble, gained weight, and was for a time able to do without morphia. Gastric trouble then recurred, and the patient eventually suffered from attacks once or twice a week, though of a milder character than before. In discussing the points of the case Zinn refers to a recent summary by Förster of the results obtained in 28 cases, fully recorded. Three of these died from the direct results of the operation. In 2 cases no relief was obtained. In the remaining 23 cases the crises were immediately relieved by operation. The relief was never permanent and varied in duration from 5 weeks to 15 months, the average apparently being about 5 months. In the majority of the cases the recurrent crises were decidedly less severe than those occurring before operation. Förster recommends that the operation should be reserved for the severest cases, in which life is threatened and other forms of treatment prove useless. It should, in addition, be only done for cases in which the clinical picture is a typical one, with attacks of severe pain and con-

tinued vomiting, hyperæsthesia of the epigastrium and neighbourhood, and marked increase of the epigastric reflex.

ANÆSTHESIA BY THE INTRA-TRACHEAL INSUFFLATION OF AIR AND ETHER.

Of the various methods devised for preventing collapse of the lungs and circulatory embarrassment during intra-thoracic operations, that devised by Meltzer and Auer for laboratory use, and subsequently used in the human subject by Elsberg of New York, seems very much the simplest, and likely to displace other methods. The principle underlying the method is that, by pumping into the trachea a continuous stream of air and ether under slight pressure, positive pressure can easily be maintained in the lungs and anæsthesia kept up at the same time. In working with animals Meltzer and Auer found that the exchange of gases through the alveolar membrane takes place quite well if a continuous stream of air and ether is allowed to enter the trachea through a tube under pressure, provided that the tube does not occupy too much of the lumen of the trachea, thus allowing escape of air through the glottis alongside the entering tube. In animals the gaseous exchange goes on although all respiratory movement of the chest is arrested. In man it has not been found necessary to raise the pressure so high as to abolish respiratory movements. Elsberg (*Annals of Surg.*, 1911, vol. i. pp. 161 and 749, and *Archiv. f. klin. Chirurg.*, Bd. lxxix. Heft 1) describes the method as he has used it in his operative work and briefly indicates the results attained. With the help of Dr. Tankauer he has devised and has had made by Messrs. Tiemann & Co., New York, a portable apparatus, arranged so as to pump air or air and ether vapour in any desired proportion and under pressure which can be easily regulated. The apparatus is intended to be driven by a small electric motor, but a foot-pump is also supplied for use where no electricity is available or in the event of the motor going wrong. The patient is first anæsthetised in the ordinary way, and when the reflexes are abolished an ordinary silk webbing catheter, No. 24 F., 30 cm. long, with a terminal opening, is passed through the glottis into the trachea. Marks are made on it at 12 and 26 cm. from the tip, and it is passed so that the 26 cm. mark is opposite the incisor teeth. In this way the tip will lie about 5 ins. above the bifurcation of the trachea in an average adult. The tube is then fixed with a simple clip and attached to the pumping apparatus. Air and ether are pumped in under a pressure of 20 mm. of mercury. If the pressure is raised to 30 or 40 mm. apnoea may be induced in man as in animals, but is not necessary.

If the tube is of correct size, allowing free exit through the glottis, the patient's colour remains good, and the pulse is full, bounding and

regular. At the time of the second report Elsberg had anæsthetised nearly 100 patients and had not seen a single untoward symptom. In one case complete relaxation could not be obtained and chloroform had to be given. In cases of intra-thoracic operations collapse of the lung was easily prevented; the heart and aorta could be handled and examined with ease. The method has also proved of value in operations on the neck, mouth, and tongue. In no case did laryngeal or pulmonary symptoms develop, while vomiting after operation was rare, and shock appeared to be less than with other methods of inducing anæsthesia.

A DRESSING FOR SKIN GRAFTS.

Sinclair (*Annals of Surg.*, October 1911) describes a useful dressing for skin grafts, burns, ulcers, etc., made by impregnating wide-meshed Brussels net with a mixture which renders it non-absorbent. The mixture used consists of white wax (2 ozs.), laundry paraffin (4 ozs.), and turpentine (2 ozs.). The wax and paraffin are melted together, the turpentine added, and the whole brought slowly to the boil. The net, previously sterilised, is dipped into the boiling mixture. If the mixture is not boiling films of wax form across the meshes of the net and make it impervious. On withdrawing the net the mixture sets, and the material is stored in an antiseptic solution such as 1:1000 corrosive. When applied to skin grafts or a raw surface the net can be covered with absorbent gauze. Discharge escapes readily through the meshes, the material does not adhere to the underlying parts, and is thick enough to keep the overlying gauze from sticking to the wound.

ANÆSTHETICS.

By J. STUART ROSS, F.R.C.S.,

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NITROUS OXIDE AND OXYGEN AS A SURGICAL ANÆSTHETIC.

THE administration of these gases in mixture for short operations is well known in this country, and has been described by Hewitt as being devoid of danger to life in a higher degree than any other known anæsthetic, but for prolonged operations it is little used. In America, however, the mixture is gaining a strong foothold as being suitable for almost all work, even abdominal. Several factors have conduced to this. Crile has shown that ether produces a demonstrable lesion of the central nerve cells, while no such effect is produced by nitrous oxide. Hamburger and Ewing have investigated the changes in the blood which follow the administration of anæsthetics, and have shown that the damage done thereto by ether and chloroform is considerable,

and may take days to recover, while the changes produced by nitrous oxide are trifling, and recover within an hour or two. Another factor which has no doubt played a part is the growing experience of surgeons and anæsthetists in the preliminary administration of such drugs as atropine, morphia, and scopolamine. Small doses of morphia and atropine or of the new preparation, omnopon, greatly facilitate the task of keeping a patient under gas and oxygen for a long period. The oxygen may be given more freely, and therefore the resulting anæsthesia is better and more suitable for abdominal work.

In the *Boston Medical and Surgical Journal* for 19th October there is reported an interesting symposium on anæsthesia at the Massachusetts Medical Society, at which the general feeling seemed to be strongly in favour of the method. Crile was quoted as having had two thousand cases without mishap. He has the gases "laid on" from the cellar, and they are delivered in the theatre at a uniform pressure of twenty-five pounds. Allen was the only speaker who reported any ill effects. He had had one death (in a patient already moribund), and knew of three others in Boston. He inclined to the view that Crile's success was due to the uniform low pressure, being doubtful to what extent this effect could be obtained by an apparatus which depends upon a supply from cylinders of compressed gas. None of the other speakers seemed to share his doubts. Mandell claimed for the method the following advantages: the patient is rendered unconscious almost immediately, and without suffering unpleasant odour or choking sensations; when the anæsthetic is stopped recovery is very rapid; there is rarely any nausea or headache, the patient feeling as if he has been asleep; liquid nourishment can be taken almost immediately; the convalescence is expedited as compared with other anæsthetics.

Hewitt's apparatus is still used by some, but other apparatuses were shown at the meeting. Most of the new ones (Teter, Gatch, Davis, Pears) provide for the warming of the gases before inhalation, while several provide also for the admixture of a small quantity of ether vapour should such seem necessary in an individual case. Such cases were stated to be rare if the anæsthetist is skilled. In none of the methods, of course, is any "re-breathing" permitted, and this form of anæsthesia is therefore expensive, a constant stream of the gases being necessary.

MELTZER'S INTRA-TRACHEAL INSUFFLATION.

At the same meeting Quinby and Ehrenfried read papers upon this method. After etherisation by the usual method a rubber tube two-thirds the diameter of the trachea is passed down it to a spot just short of the bifurcation, and ether vapour, warmed and moistened, is pumped down continuously; the return flow takes place between the tube and trachea. Natural respiration soon ceases, but the

blood remains well aerated, and the heart-beat and blood-pressure are very satisfactory. Ehrenfried has introduced a useful device into his apparatus. He had had cases where laryngeal spasm had supervened, blocking the outflow. The resulting rise in intra-pulmonary pressure would undoubtedly be dangerous, and he has therefore connected with the supply tube a safety-valve which "blows off" if the pressure rise to an undesirable level. Meltzer's method was introduced for cases in which the pleural cavity was to be opened, but the resulting anaesthesia is so good that it is finding favour for many other cases. In tongue and tonsil cases the persistent flow of returning air serves to exclude blood from the respiratory passages. Cotton mentioned that it is disconcerting to see a patient under an anaesthetic making no movements of natural respiration, but is convinced of the value of the method.

OBSTETRICS AND GYNÆCOLOGY.

By J. W. BALLANTYNE, M.D., F.R.C.P.E.,

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MENSTRUATION AFTER CURETTAGE.

DR. FRANZ JAEGER (*Zentralbl. f. Gynäk.*, No. 38, 23rd September 1911) has made a series of investigations into the occurrence of menstruation after the removal of the uterine mucous membrane, and especially after curetting for endometritis and abortion. Comparatively few observations on this subject have been published in recent years, but Jaeger refers to Bondi's and to Engländer's papers. Bondi found that after curettage menstruation generally returned at the proper time, and that the type was unaffected; and Engländer noted that in nearly 65 per cent. of cases of abortion menstruation returned after four weeks, but in some instances was delayed till five weeks or longer. Dr. Jaeger gives details of 25 patients who were curetted for endometritis. In 16 of them (64 per cent.) the curettage produced no effect on the menstrual type, and in four others the period only varied from the normal by a day or two, so that in 20 patients (80 per cent.) the removal of the mucous membrane may be regarded as having no influence on the type. In two cases, however, the period was delayed for a fortnight, and in one case it occurred 14 days too soon; in the remaining two cases the next period was intermitted altogether or came on after three weeks. It has been found that the mucous membrane is very quickly regenerated after curetting, and it is not thought that the state of the mucosa will furnish an explanation of the deviations from the normal noted in this series of cases. The ovary with its secretion is the dominating organ, the uterus playing the part of an

“executive”; variations from the normal menstrual type are therefore to be referred to disturbances in the secretory action of the ovary rather than to the state of the uterine mucosa (*e.g.* to the removal of it down to and into the musculature). This conclusion is supported by the fact that in one case menstruation came on two days after curetting, in two cases five days after, and in four cases ten days after the operation; the period was due in these instances, and it arrived notwithstanding the recent removal of the mucous membrane. In a second series of 25 patients curettage was performed for abortion. In them it was noted that the regularity of the return of menstruation was not so marked: in 14 cases (56 per cent.) it occurred between 21 and 28 days after the curetting, in 7 cases between 29 and 35 days, in 1 case in 6 weeks, in one in 7 weeks, and twice it appeared in two weeks. It was shown that the duration and degree of the hæmorrhage at the time of the abortion and the age of the pregnancy when the latter occurred had no effect on the return of menstruation. Attention is drawn to the fact shown by Polano that the uterine mucosa is more quickly regenerated after a curettage for abortion than after the spontaneous expulsion of the uterine contents. The conclusion is reached that the return of the menses after abortion depends, not upon the regeneration of the mucosa nor upon the involution of the uterus, but upon the antagonistic variations in the relations between the function of the ovary and that of the placenta. Only when the inhibitory influence of the placenta upon menstruation has been fully removed can that process be re-established, and this accounts for the delay in the return of the menses after curettage for abortion as compared with its swift return after an ordinary scraping for endometritis.

CONSERVATIVE SURGERY OF THE UTERINE ANNEXA— UTERO-OVARIAN ANASTOMOSIS.

Dr. O. Uffreduzzi (*Annali di ostetricia e ginecologia*, vol. ii. for 1911, pp. 57-100) has made a series of experiments on rabbits and guinea-pigs with a view to discover new ways by which the ova may reach the uterus when the normal route by the Fallopian tube is closed. He points out that researches on the transplantation of ovaries have clearly shown that the autoplasmic transplantation succeeds almost constantly; the homoplasmic only occasionally, and that almost solely where embryonic organs in young animals of the same species are dealt with; and that heteroplasmic and heterosexual transplantation fails practically in every case. The practical outcome of these experiments is that in some cases patients may be thus saved from the unpleasant results of the premature menopause induced by operation, and from the atrophy of the genital organs; but obviously such patients must remain sterile. Now, three separate kinds of operation have been attempted to remove

the latter disability. First amongst these is salpingostomy, the procedure by which the closed ostium abdominale of the tube has been reopened, or (more correctly) that by which a new ostium is formed in the tube wall. The second operation is that of salpingo-ovarian anastomosis, or synthesis. Clado's operation, for instance, consists in the accurate suturing of the tubal ostium (either the normal one or the newly-formed artificial one) to the ovary, or to what remains of that organ, with the purpose of securing the contact of these structures. The ovary may be loosened from its normal position or retained there. Gersuny made the ovary project into the tubal lumen. The third operation is that of utero-ovarian anastomosis, introduced by Döderlein. It is devised to meet the cases in which the whole tube is removed, and consists in the implantation of the ovary in the uterus in such a way as to make the former project into the cavity of the latter, with the hope that ovulation may occur directly into the uterine cavity. Uffreduzzi has been informed by Döderlein himself that he had practised this operative procedure in twelve cases, with immediate good results in all, and with continuation of menstruation in some instances; sufficient time had not elapsed to judge of its value in favouring the occurrence of pregnancy. It is in order to clear up the question of the possibility of getting good results from utero-ovarian anastomosis that Uffreduzzi has conducted experiments on the lower animals. There were two series, each with two groups. In the first series there was transplantation of the ovary into the uterus, either into its cavity (first group), or into the thickness of its wall (second group); sometimes the vascular pedicle of the organ was retained, sometimes it was not; the uterus was normal, pregnant, or puerperal. Nineteen experiments were made upon this operation, which the author terms utero-ovarostomy. The result was that in all cases the part of the ovary which projected into the uterine cavity underwent complete necrosis and disappeared, in a time varying from a few days to a month. The mucous membrane soon grew over the ovarian tissue left in the wall of the uterus, and a muscular layer also developed, separating entirely the uterine cavity from the transplanted ovary. In none of the experiments did the ovary remain in contact with the uterine interior; but, further, in every case it was found that both mucous membrane and muscular tissue shut it off. No corpus luteum was found in the part of the ovary nearest to the uterus. The conclusion, therefore, is reached that it is impossible to establish a permanent communication between the ovary and the uterine cavity, and that, with the means at present known, direct ovulation into the uterus cannot be obtained. In the second series of experiments the attempt was made to keep patent an artificial opening in the tube, the ostium abdominale having been previously closed (first group); in no case was this successful. In the second group of the second series of experiments a similar attempt was made to keep patent an opening

made in the uterine cornu at various parts; but, again, all these artificial openings, in whatever way they were made, were found closed and the uterine wall regenerated. Frequently adhesions with the intestinal coils or parietal peritoneum were found associated with the closure of the openings in the tubes or uterine cornua. These experiments, therefore, would appear to discourage attempts to conserve the reproductive functions of the ovaries and uterus in cases of removal of the tubes; but, of course, the value of the retention of the ovaries so as to secure the advantages of their internal secretions is not in any way lessened. The Fallopian tubes apparently are necessary parts in the mechanism of conveyance of ova to the uterine interior.

OBSTETRIC COMPARISONS.

Dr. Marks (*Australasian Med. Gaz.*, 20th July 1911) makes some interesting comparisons between obstetric practice in the Lady Bowen Hospital, Brisbane, and in the Rotunda, Dublin. Of course the total number of patients was very different in the two institutions, there being 2369 admissions (with 2045 deliveries) in the case of the Rotunda, and only 520 (with 423 deliveries) in the Lady Bowen; the comparisons, therefore, are less valuable than they might otherwise have been. First, in relation to puerperal morbidity: if the British Medical Association method be employed the morbidity in the Lady Bowen appeared to be five times more than in Dublin (as 19 to 3·75); but if the Rotunda method (in which morbidity = temperature and pulse over 99° and 90° for three consecutive takings) be used, it was only double (as 5 to 2·49). The comparison was for the year 1909, and the difference was partly accounted for by the presence of dengue in Brisbane; further, the morbidity was very low in Dublin that year, having been 10·76, 6·67, and 4·33 in the three preceding years. Eclampsia was found to be nine times more common in Brisbane than in Dublin. "Why," asks the writer, "should women living, as they do in this country, a cleaner, healthier, more outdoor life, be more prone to this disease than those living in the slums of such a city as Dublin, the filth, squalor, and poverty of which can only be understood by those who have had experience of them?"

Eclampsia was also more fatal in Queensland than in Ireland, for out of 13 deaths in the Lady Bowen (in three years) the mortality from eclampsia accounted for 9; and the eclampsia mortality rate itself was 27·3 as compared with 11·1 per cent. in the Rotunda. Dr. Marks offers the explanation that perhaps in a semi-tropical climate more work is thrown on the kidneys through an insufficient quantity of fluid being taken to counterbalance the perspiration. He thinks the eclampsia is of a graver type, for the method of treatment employed closely resembled that carried out in the Rotunda.

Deformities of the pelvis were very rare in Brisbane, for no case in three years had occurred requiring more than the use of forceps.

SUCCESSIVE TUBAL PREGNANCIES.

Dr. M. Rabinowitz (*Amer. Journ. of Obstetrics*, vol. lxiv. pp. 238-250, August 1911) gives clinical and pathological details of two instances of ectopic pregnancy occurring twice in the same patient. In the first case the interval between the two pregnancies was seven years and seven months, and in the second it was one year and eight months; both patients were over thirty years of age (34 and 37 at the time of the first ectopic pregnancy). On all the four occasions laparotomy was performed. In one of the repeated operations the ovary was removed with the tube, and in the other it was left behind *in situ*. The writer believes that gonorrhœal salpingitis is the predominant cause of tubal pregnancy, and that it acts by destroying the ciliated epithelium. Further, the ascending gonorrhœal infection generally affects the tubes successively, so that it is not unusual for the non-pregnant tube to appear healthy at the time of operation, and be left behind to undergo further morbid changes, and prepare for a second ectopic gestation later. Dr. Rabinowitz does not favour plastic surgery on the unimpregnated tube (*e.g.* liberating it from chronic adhesions, opening its closed fimbriated end, etc.), for it may expose the patient to the risk of subsequent ectopic pregnancy. The rule should be that during the operation for tubal gestation the unimpregnated tube should be carefully examined, and if it show evidences of either a recent or a remote pelvic peritonitis (along with a history of gonorrhœal infection) it should be removed in order to prevent the risk of a second ectopic pregnancy in the patient at a later date.

PELVIMETRY IN PREGNANCY.

Dr. John G. Dickert (*American Medicine* (N. S.), vol. vi. pp. 411-420, August 1911) enters a plea for a more careful estimation of the capacity of the female pelvis during pregnancy. He is of opinion that pelvic measurements should be made in all primiparas without exception, and in all multiparas who have had previous difficult labours. The three important measurements are the external conjugate, the diagonal conjugate, and the sacro-pubic diameter (for contraction of the pelvic outlet). If the external conjugate measure 8 ins. or more there is ample room as a rule; whilst if the diagonal measure $4\frac{1}{2}$ ins. or less, there is contraction. If the true conjugate be below $2\frac{1}{2}$ ins., Cæsarean section must be done whether the fetus be alive or dead; if it be 3 ins., craniotomy is to be preferred with a dead fetus, Cæsarean section with a living one. If the *conjugata vera* be $3\frac{1}{2}$ ins. it is better to do Cæsarean section if the patient be

in good health, and is seen at or before the onset of labour, but other means should be tried if she has been in labour for some time. Even when the *conjugata vera* is less than 4 ins. and more than $3\frac{1}{2}$ ins. Dr. Dickert would regard Cæsarean section as the operation of election if the patient is in good health, is seen at term, or before the onset of labour. Two hours of second stage pains may be allowed before operative interference, but it must ever be remembered that every hour of delay lessens the chances of recovery in Cæsarean section.

PHYSIOLOGY.

By T. H. MILROY, M.D.,

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THE EFFECT OF EXERCISE UPON THE VENOUS BLOOD-PRESSURE.

THE experiments recorded by D. R. Hooker (*Amer. Journ. of Phys.*, vol. xxviii. p. 235) were mainly carried out on the human being. The experimental procedure was as follows:—The subject was seated on a stationary bicycle such as is used in gymnasia for exercise. Both hands rested on the handle-bars, one being employed to maintain balance and position, the other being relaxed as much as possible, and on it the determinations of venous pressure were made. The instrument which was employed was a modification of that devised by Recklinghausen. The pressure was taken before and at varying intervals during exercise. In all cases the pressure rose during exercise, the rise varying from twice to about four times the normal. The exercise was in most cases prolonged until some degree of fatigue set in. Experiments were carried out on animals for the same purpose. In these cases a group of muscles was kept in action by electrical stimulation of the motor nerve, while a record was taken of the venous pressure in the external jugular or femoral vein. A sharp rise of about 4.5 cm. (10 per cent. sodium citrate solution in manometer) was observed at the onset of muscular exercise, accompanied by an increase in the respiratory movements. With the cessation of the excessive respiratory activity the venous pressure fell to a point 2 cm. above the control, remaining at this level throughout the period of muscular exertion. The arterial pressure remained unchanged.

This rise in venous pressure appears to be too sudden to be accounted for on Henderson's hypothesis, namely, an increase in venous tone due to an accumulation of carbonic acid in the blood. The rise might be due to a vaso-constriction in the splanchnic area, giving rise to a general venous plethora. From Bayliss and Starling's experiments on the effects produced by splanchnic excitation the rise in venous pressure which occurs is apparently independent of the heart-rate and arterial

pressure. An important factor, other than the splanchnic vaso-constriction, is the change in the heart beat during muscular exercise. There is not only a marked increase in the rate of the heart, but also a remarkable decrease in its volume, as observed in skiagrams. The decrease affects the ventricles, while there is seemingly an increase in the auricular volume, the latter being probably due to a damming back of the blood into the auricles, causing their dilatation and subsequently a rise in the venous pressure.

Hooker attempted to test the validity of this explanation by taking the venous and arterial pressures before and after acceleration of the heart produced by cutting the vagi. In both cases which were investigated there was a small rise in venous pressure, and as the arterial pressure remained above the control before vagal section, the possibility of the rise in venous pressure being due to a loss of arterial tone was excluded. It therefore seems probable that acceleration of the heart-rate with a resultant decreased unit output is one factor in the rise of venous pressure which accompanies muscular exercise. If this be accompanied by an actual decrease in the capacity of the total arterial stream bed, we might expect a still greater rise of venous pressure.

The persons who exhibited the greatest rise of venous pressure were those in poor physical condition from an athletic point of view. The heart must suffer strain both from the increased arterial resistance and also from the venous congestion.

The probable sequence of events leading to a rise of venous blood-pressure during muscular exercise may be briefly stated as follows:—

At the outset there is a local vascular dilatation in the active muscles coincident with an expression of blood from the veins. This results in a prompt rise of venous pressure. The consequent transitory fall of arterial pressure is followed by an accelerated heart-rate, which may, under certain circumstances, interfere with the effectiveness of the heart, and help to produce a stasis of blood in the great veins. Finally, a compensatory vaso-constriction occurs in the great splanchnic area, including the portal vein, which shunts the blood to the active muscles. There is, as a consequence, a venous plethora, which expresses itself as a rise of venous pressure which continues throughout the period of activity.

ACAPNIA AND GLYCOSURIA.

One of the most important factors involved in the maintenance of the normal metabolism of the cell is the internal respiration. It has often been noticed that there are disturbances of breathing in various forms of experimental diabetes. It has been pointed out by many investigators that an insufficient supply of oxygen to the cells (as in CO poisoning) results in a well-marked glycosuria. According to Edie, Moore, and Roaf (*Biochem. Journ.*, 1911, p. 325) an excess of CO₂

in the air breathed apart from oxygen deficiency may result in glycosuria.

Henderson and Underhill (*Amer. Journ. of Phys.*, vol. xxviii. p. 275), continuing the former's work on the nature of acapnia, that is a diminution of the CO_2 content of the blood, have investigated the CO_2 content of the blood in various forms of experimental diabetes. They thought that the glycosuria which seems occasionally to follow violent emotions in man or in lower animals may be due to the excessive respiratory activity, with a consequent lowering of the CO_2 content of the blood from excessive pulmonary ventilation.

In diabetic coma an acute acapnia occurs which is due to a hyperpnea and not merely to an expulsion of CO_2 from the bicarbonates of the blood by acids. The authors hold that the hyperpnea of diabetic coma is induced by the ethereal, not the acid, bodies present (*e.g.* acetone) in diabetic coma.

REVERSAL OF THE REFLEX EFFECT OF AN AFFERENT NERVE BY ALTERING THE CHARACTER OF THE ELECTRICAL STIMULUS APPLIED.

Sherrington and Sowton (*Zeitschr. f. allg. Phys.*, Bd. xii. S. 485), continuing the investigations of the former on the reflex effects produced by stimulation of an afferent limb nerve, obtained some interesting results by varying the character of the afferent stimuli. In the decerebrate mammal the reflex effect produced on the isolated vastocruureus muscle on stimulation of an afferent limb nerve is, under ordinary conditions of stimulation, a rapid relaxation. If the stimulus be strong, the muscle relaxes rapidly and greatly: if weak, the relaxation is slower and less marked. It was found that with certain forms of stimulation or using the same preparation reflex contraction could be produced. Thus if galvanic stimulation were employed, relaxation occurred if the stimuli were strong: while if quite weak, contraction occurred. The same occurs with weak faradic stimulation, although the contraction is shorter in duration.

If the galvanic stimulation be not only weak, but its onset and fall less abrupt than normal, as may be obtained by the use of a rheonome, the contraction is still more prolonged, and a weak tonic contraction may be kept up during the whole time that the current is waxing and waning.

In order to obtain this contraction reflex the symptoms of shock must as far as possible be absent, otherwise it is not elicited. As the symptoms of shock are more marked in the decapitate than in the decerebrate animal, the contraction reflex cannot be obtained in the former, although the relaxation can be readily produced. The effects may not only be produced on the same side but also on the opposite

one, the reflex in each case being of the same character. It is evidently, therefore, not a part of the limb's stepping reflex, because in stepping the two limbs are always conversely, not symmetrically, moved. The great interest of the investigation lies in the fact that stimulation of the same afferent nerve may give rise to two different reflex effects, according as the stimuli be strong or weak. It recalls the different effects which are produced in the blood-vessels of the limb when the distal end of the sciatic nerve is stimulated by infrequent or frequent stimuli.

It is still doubtful as to the way in which these double effects are brought about. One might assume the co-existence in the nerve of two different kinds of afferent nerve fibres, one which calls forth contraction and the other relaxation, the former more excitable under the influence of weak, long-continued stimuli, the other by stronger and sharper stimuli.

THERAPEUTICS.

By F. D. BOYD, C.M.G., F.R.C.P., and J. EASON, F.R.C.P.

TREATMENT OF TETANY.

ALTHOUGH tetany is more interesting to those who are specially engaged in the treatment of children, it is nevertheless a condition of much importance to the surgeon performing thyroidectomy, to the physician in gastric and intestinal cases, and to the obstetrician as one of the diseases prone to occur during pregnancy.

During the past ten years more or less fruitful efforts have been made to elucidate its pathology and to place the treatment on a scientific basis. The researches on this subject are the sequel to the observation made in 1896 by Vassale and Generali, that the symptoms of tetany following experimental and therapeutic thyroidectomy were due to accidental damage or removal of the parathyroid glands.

Although parathyroidal damage is held by many to be the cause of surgical tetany, it is not yet proved that spontaneous tetany is invariably associated with changes in the parathyroids.

Erdheim, Yamase, Haberland, Escherich, Biedl, Pineles, Pépère, Silvestrini and Mondorsi and others have found parathyroidal lesions in the spontaneous tetany of children. Again, Erdheim, Adler, Thaler, and von Frommer have experimentally shown that the tetany of pregnancy is due to hypoparathyroidism, and Fischer has recorded clinical evidence in support of this view.

In some cases of spontaneous tetany, however, the parathyroids have appeared to be normal. Schaffer and Rheindorf examined 400 serial sections of the glands in a fatal case of tetany and found no evidence of hemorrhages. In a case of infantile tetany Ravenna

found no abnormality in the parathyroids. Erdheim found them normal in a case of gastric tetany. Wirth, on the other hand, found decided pathological changes in three cases of gastric tetany occurring in elderly people.

In spite of this (apparently contradictory evidence), such eminent authorities as Chvostek, Pineles, and von Frankl-Hochwart regard all forms of tetany as due to a tetany poison, which is somehow related to parathyroidal insufficiency. Such a theory naturally suggests the transplantation of parathyroid tissue as a possible treatment of the disease. Von Eiselsberg has successfully tried this treatment in the case of a woman who suffered from tetany after total strumectomy. A parathyroid was obtained from a patient who required to have a simple cyst enucleated from the thyroid gland; it was then imbedded in the substance of the rectus muscle of the woman's abdomen. Soon after the transplantation the symptoms of tetany vanished and the nerves gave a normal response to electrical stimulation.

Krabbel has had two successful cases, one being that of a woman nine or ten years after thyroidectomy which caused her tetany symptoms. During these years thyroid had been frequently used with transient effects. The first parathyroid transplantation in the tibia was not completely successful, but a second between the abdominal fasciæ and peritoneum was followed by "cure." It is very interesting and important to note that the second case was one of idiopathic tetany.

Danielsen and Böse have each reported successful results by this method of treatment.

Loewenthal and Wiebracht report good results in two out of three cases of tetany by the oral administration of parathyroid; they found the fresh glands were ten times more active than tablet preparations. Halstead mentions a case of post-operative tetany in which immediate relief was obtained by the administration of beeves' parathyroids, although the patient remained an invalid, probably owing to the loss of the glands.

Feer found that decided improvement took place in a stubborn case of spontaneous infantile tetany by using parathyroidin.

Schneider reports a case of post-operative tetany cured by the administration of the parathyroids of the horse. The dose given was 0.02 grms. of dry substance. In this case thyreoidin (B. W. & Co. and Merck) had previously been tried and failed to relieve the symptoms. E. Bircher has also successfully treated two cases of post-operative tetany. After thyroid treatment had been tried without success tablets of parathyroid were given. As no relapses occurred after the treatment was stopped, Bircher looks to compensatory growth of parathyroid remnants for explanation.

Vassale recommends in the tetany of children combined thymus and parathyroid opotherapy.

Luger reports the case of a man, aged 23, who suffered from alternating attacks of tetany and epilepsy, in both of which conditions parathyroid treatment had no effect.

Parathyroidin (Vassale) has been tried in cases of surgical tetany with varying results.

Halstead and Putmann have reported favourable therapeutic results in post-operative tetany with the use of Berkeley's parathyroid nucleoproteid. After internal administration, and, still better, after subcutaneous injection of this preparation, the symptoms immediately vanished.

There is no doubt that in many cases of post-operative tetany thyroid preparations are also of the greatest service, not only in allaying the symptoms quickly, but if their use be continued, in keeping them permanently away. Kocher is the chief exponent of this form of treatment, and Biedl gives his emphatic approval, although he is unable to give any explanation of its mode of action. Biedl states that the exhibition of thyroid gives time at least for any accessory parathyroids to develop their full activity, and for the surgeon to prepare if possible for parathyroid transplantation.

It is frequently stated that the dangerous symptoms which develop after removal or damage of the parathyroids may be prevented by the administration of large doses of calcium salts. Silvestrini and Mondorsi, however, think this method of treatment has no therapeutic value. They maintain that tetany can be prevented by large doses of thyroid extract, in which case calcium does not come into consideration. They think it improbable, too, that serious and sudden disturbances of calcium metabolism will be removed by mere administration of calcium salts. According to them, examination of the blood and excretions does not show a disturbance of the calcium metabolism after removal of the parathyroids. They believe an abnormal disintegration of the albumin molecules occurs, demineralisation merely being a secondary phenomenon. The intermediary metabolic products which develop in consequence of the absence of the antitoxic function of the parathyroids may be detoxicated by repeated doses of calcium salts. Stölzner supports these views. Canal, on the other hand, agrees with MacCallum that the parathyroids regulate calcium metabolism. Their removal leads to a rapid excretion of calcium salts, with which there goes hand in hand diminished absorption of calcium. He found also that callus was very slowly formed after fracture. Escherich has suggested a pathogenetic link between tetany and rachitis, attributing both to parathyroidal insufficiency, and Erdheim has found in parathyroid-ectomised rats severe changes in their gnawing teeth associated with fracture of the alveolar processes.

Parhon and Dimitresco, in agreement with Cooke, found more calcium in the nerve centres after removal of the thyroidea and

parathyroidea than in control animals. On the other hand, in infantile tetany the calcium of the brain is diminished according to Quest.

J. Loeb finds that abnormal muscular twitchings and contractions may be brought about experimentally by reducing the proportion of calcium and magnesium in the muscles and blood. By injection of any salt liable to precipitate calcium salts twitchings of the muscles are produced.

Netter states that marked improvement has occurred in cases of infantile tetany following the administration of calcium salts. MacCallum and Voegtlin affirm that soluble calcium salts exert a wonderfully curative effect on the tetany of dogs following parathyroidectomy. Melnikow found in animals showing tetanic spasms after parathyroidectomy that the injection of calcium acetate solutions quickly causes a briefly enduring improvement. Rosenstein noted that spasmophilia was temporarily relieved and electrical excitability diminished by oral administration of 100 c.cm. of 3 per cent. CaCl_2 , and Schabad has found that both in tetany and in rachitis convalescence goes hand in hand with calcium retention. The most interesting recent observations are those made by Arthus and Schafermann, who found that by oral administration of calcium salts to thyro-parathyroidectomised rabbits life was considerably prolonged. The animals were killed a month after the operation and no remnants of parathyroids were found. Subcutaneous administration of calcium was not so effective.

Basing experiments on the discovery of Matthew Hay, Meltzer and Auer and others that magnesium is a powerful agent in producing relaxation of muscle tissue, Canestro found that by the subcutaneous injection of magnesium sulphate and chloride the tetany of parathyroidectomised dogs was relieved. He obtained the best results with isotonic solutions (= 7.31 per cent.). Although the animals died, as they invariably do, there was a very remarkable diminution of the spasms and a postponement of the fatal end. He suggests that magnesium salts may have some therapeutic value in cases in which there is a partial lesion of the parathyroids. Jovane confirms Canestro's observations.

Very recently Joseph and Meltzer have experimented with injections of molecular solutions of sodium chloride. In their opinion the results are better than those obtained by MacCallum and Voegtlin with calcium salts. In all their experiments the animals were permanently relieved of tetany, although they died sooner or later under signs of exhaustion. MacCallum and Voegtlin, on the other hand, hold that injection of sodium or potassium tends to intensify the symptoms, but they have only published one injection experiment, which they themselves designate as "especially unsatisfactory." Rosenstein found that spasmophilia was made worse by the oral administration of sodium chloride.

The various methods of treatment have each their supporters, but

more extensive clinical trial will be required before their relative therapeutic value can be estimated.

The form of tetany occurring during pregnancy has been studied by Frank. He has seen eleven cases. In mild cases he recommends the administration of the bromides, but it may be necessary in grave cases to induce premature labour.

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NEW BOOKS AND NEW EDITIONS.

The Feeble-Minded. By E. B. SHERLOCK, M.D., Barrister-at-Law.
With an Introductory Note by Sir H. B. DONKIN, M.D.
Pp. 327. London: Macmillan & Co., Ltd. 1911. Price 8s. 6d.

IN plan and execution this differs considerably from any other English book on mental defect, and it is, in many respects, a decided advance on most of them. To describe it as an introduction to the subject would be only partially true, for though it is this, it is a good deal more. Dr. Sherlock attacks the problem of the feeble-minded from its very origin. To understand what is meant by "feeble-mindedness" we must have some idea of the normal mind, and accordingly the book opens with a discussion of the nature of mind and its basis, the brain. Dr. Sherlock then describes the characteristics of the

feeble mind—its peculiarities of presentation, memory, attention, etc.—and thereafter the basis of the feeble mind—the abnormal brain, the physical defects. The last three chapters treat of the cause, the varieties, and the treatment of mental defect. Thus the scheme of the book is ambitious. Dr. Sherlock brings to his task a mind thoroughly trained in psychology and biology, and the result is a book which no one who has to do with mental defectives can afford to neglect. The first part of the book is the best, giving as it does an excellent account of normal and abnormal mental processes and brain structure. The purely clinical part scarcely reaches so high a level. A number of interesting points in connection with the morbid anatomy of mental defect are recorded, and some current notions are upset. Thus abnormalities of the teeth and jaws are not, he finds, unusually common. Sclerosis of the hippocampal region has little relation to epilepsy. There is no evidence that smallness of the cerebrum is characteristic of imbecility, but in some cases at least the cortical layers of cells are reduced in size. On the whole this chapter but serves to show how little we really know of the relation of morbid processes to mental defect. The various alleged “causes” of feeble-mindedness are discussed in a critical and rather destructive manner. The author has kept an open mind, and seems indisposed to go further than to regard imbecility as a “variation or mutation,” cause unknown. He does not regard parental alcoholism as proven. His classification of the feeble-minded is primarily on a sociological basis, degrees of mental defect represented by the terms idiocy, imbecility, and weak-mindedness. These again may exist in various clinical groups—ateliotic, mongolian, micro- and macrocephalic, epiloiae, plegic, progressive, and residual. No one has yet propounded a quite satisfactory classification of mental defect, and it is no more difficult to pick holes in this than in others. In making the following criticisms, therefore, we in no way wish to detract from an appreciative review of Dr. Sherlock’s book. The ateliotic cases are the “children who never grow up”—mental, and sometimes bodily, infants. Ateliosis has been coined to denote a particular form of infantilism, and we think that to use it in a wider sense than its originator intended may lead to confusion. For the rest, the group is a natural, and, pending further research into the causes of infantilism, a useful one. Epiloia is a name invented by the author to denote the interesting malady, tuberculous sclerosis. This disease is one of the very few forms of imbecility which has a definite morbid anatomy, and the name by which it is commonly known is descriptive of the most constant lesion. The fact that it can in some cases be diagnosed during life does not appear to be any reason for giving it a new designation based on clinical consideration. The progressive group, again, comprehends a series of diseases the morbid anatomy of which is known general paralysis,

and amaurotic idiocy among them, and one would prefer to have these classified on a pathological basis. The chief forms of syphilitic dementia would fall into this group, and it is practically important to emphasise their syphilitic origin, because syphilitic mental defect tends to deterioration. Epilepsy is regarded merely as an incident of feeble-mindedness, and for this reason there is no special group of epileptic imbeciles. Yet one knows that many of the "residual group" will have epilepsy as a marked symptom, and since epileptic imbecility demands special handling, and as the prognosis of mental defect is influenced by epilepsy, a group of epileptic imbeciles is one which we would be unwilling to dispense with. These criticisms are made with some diffidence, so highly do we appreciate Dr. Sherlock's book, and their validity depends to some extent on the point of view, that of the reviewer being a purely clinical one. In concluding we can only repeat that *The Feeble-Minded* marks a decided advance in the literature of the subject, and we congratulate the author very sincerely on his work.

Modern Treatment: The Management of Disease with Medicinal and Non-Medicinal Remedies. In contributions by American and Foreign Authorities. Edited by HOBART AMORY HARE, M.D., assisted by H. R. M. LAUDER, M.D. Two Volumes. Pp. 930 and 900. London: Henry Kimpton. 1911. Price 63s. net.

IN these two large volumes the medical treatment of disease is discussed with great fulness. They contain an enormous mass of information on all branches of therapeutics, and they are so good that they deserve a high place among books of reference. Therapeutics, as Dr. Hare reminds us in his prefatory remarks, has made great strides in the last quarter century. Twenty-five years ago the measures at our disposal to cure disease were drugs, climate, electrotherapy, and baths; now there are added serums, vaccines, and opotherapy, and there is a far greater approach to specific treatment than we have ever before attained. The pharmacologist, chemist, and pharmacist have enlarged our materia medica; remedies are better understood, new ones have been evolved, and all of them are placed in our hands in forms in which they can readily be employed. To bring out a work of this magnitude a large staff of collaborators was required, and Dr. Hare has entrusted the various sections to men whose reputations, for the most part, already stand high for research on their special subjects. Thus the chapter on cardiac therapeutics is from the pen of James Mackenzie; Beebe writes with authority on the thyroid and glandular therapeutics; Tyson on renal disease; Friedenwald and Ruhrah on diet; Bowditch Potter on vaccines; Dorcum on the rest cure and morbid habits. Names such as these

sufficiently guarantee a high standard. The work opens with some general chapters on modern pharmacology by Horatio Wood, giving a good account of the relation of physical and chemical constitution of drugs to their action; on prescription writing, by Hunsberger; on the untoward action of drugs, by R. D. Rudolf. This last is a particularly interesting and informing piece of work. Next comes a series of chapters on non-medicinal therapeutics—climate, exercise, baths, water cures, electrotherapy, radio-activity, foods, rest cure, disinfection, serums, vaccines, opotherapy. We note that there is no chapter on the now fashionable “suggestion therapeutics” or on hypnotism. Psycho-analysis is only incidentally mentioned. In view of the interest which Freud’s teaching is now exciting, we think some more lengthy description of it would have been appreciated by readers of the book. In the remaining three-fourths of the work the treatment of individual diseases is discussed. Throughout the writers of the various chapters have been at pains to express their personal experience, and this makes the book much more useful and readable than if an attempt had been made to collate all the methods of treatment that have ever been proposed. As a reference work *Modern Treatment* will be found of great value; its information is well arranged, there is little overlapping of subject, and there is a full index.

Pleurisy: including Empyema and Bronchiectatic Conditions. By ALEX. JAMES, M.D., F.R.C.P.E. With Illustrations. Pp. 243. Edinburgh and London: Oliver & Boyd. 1911. Price 6s. 6d. net.

THIS book is the fruit of a large experience in hospital and private practice. Dr. James’s interest in pleurisy has long been well known, and his authority as a teacher of the subject is widely recognised. This volume, embodying the careful records of hundreds of cases and containing his mature judgment on the different problems of etiology, pathology, and treatment, will therefore be received with great interest.

A notable feature of the book is that it is truly authentic. Dr. James does not give us the common stock of opinions on pleurisy, and he rather emphatically refuses to cumber his pages with a litter of references to current and past literature on the subject. He presents the record of his own experience and gives the conclusions which that experience has led him to. These conclusions often coincide with the accepted doctrines on pleurisy; they sometimes sharply diverge from them; but throughout, whether commonly accepted or singular, they have been brought to the test of his experience, and bear clearly the stamp of his independent judgment.

An introductory chapter is largely devoted to what may be called the dynamics and hydrostatics of an effusion in the pleural sac.

Dr. James then discusses in some detail the etiology of pleurisy, both sero-fibrinous and purulent, emphasising any views that are important, or peculiarly his own, by illustrative cases. In this section of the book he has a good deal to say on the general question of bacterial infection. His position briefly is that in nearly all germ infections the pathogenic faculty of the micro-organism is much less important than the vital condition of the host in whose tissues it has become parasitic. This general view is most pronounced with regard to the tubercle bacillus. Dr. James believes that Koch's bacillus is "ubiquitous" in nearly every human body (whether circulating in the blood or merely resident at many points in the tissues he does not say), and that the fact of its invasion or implantation is much less important than the condition of the body—the receptivity of the soil in which it is sown. This leads him to a position which he is not afraid to face. He boldly states that "the idea that an individual with tuberculous disease who observes cleanliness, and who lives among people who do the same, is a source of danger to his neighbours is as false as it is cruel." Given good sanitary conditions, he will not admit that consumption is "dangerous from person to person" any more than pneumonia or scurvy. This teaching runs strongly against the stream of modern bacteriological doctrines on infection, and against their practical outcome in preventive medicine; but it need not be further noted here, as it really lies outside, although close to, the borders of the subject of the book.

The main body of the book is occupied with a very full discussion of the varieties of pleurisy in carefully classified groups—it contains the cream of Dr. James's rich experience. Everywhere important principles in clinical phenomena, diagnosis, and treatment are illustrated with examples. In arrangement, in clearness of teaching, in accurate definition of clinical types, and in abundance of illustration these chapters reach a very high standard of excellence. Where there is so much to praise, two minor points of criticism may be permitted. The very full exposition of empyema might have been made complete by a separate description of the clinical features of empyema in childhood. Again, in a most interesting chapter on fetid empyema the bacillus coli is in some cases mentioned as occurring in the pus along with other organisms. In certain of these cases the record bears a definite account of previous abdominal disturbance, *e.g.* appendicitis, dysentery, typhoid fever. Dr. James does allude to abdominal infection of the pleura, but he might have emphasised more this interesting invasion of the thorax by an organism normally resident in the abdomen.

The book closes with a most valuable chapter on treatment. The principles of treatment are stated in a masterly way, and their application in all varieties of clinical condition is discussed with great detail.

Special notice must be given to the records of cases. They are unusually complete, both in regard to previous history of the patients, and the conditions present on examination. The latter include all the modern refined methods of clinical investigation, such as the opsonic index, cytological examinations, and bacteriological data. Whether the conclusions based on these data stand the test of future research or not, these very full and careful records have a permanent value, and of themselves make Dr. James's book a classical contribution to the subject of pleurisy.

Andreas Vesalius, the Reformer of Anatomy. By JAMES MOORES BALL, M.D. Large Quarto. Pp. xvii. + 149. St. Louis Medical Science Press. 1910. Price \$5.

DR. BALL, in his preface, draws attention to the hardly credible and far from creditable fact that there does not exist any adequate biography of Vesalius in the English language. "Most of the Vesalian literature," he remarks, "has been in the form of brief articles for the medical press," and he adds, "perhaps the best example of this class is the article by Mr. Henry Morley . . . in *Fraser's Magazine* for 1853." If, however, Dr. Ball intended to remove this reproach from English medical literature, he has sadly failed. He has, indeed, produced a very handsome volume. It is splendidly got up, printed on vellum, profusely and excellently illustrated, beautifully printed, amply margined, but it does not fill the blank. The greatest part of the book is taken up with a sketch of anatomical history and with the lives of prominent anatomists, so that only a comparatively small space is given to Vesalius. Indeed this latter part is only about one-third longer than Morley's article, which, it must be remembered, was only a popular sketch in a lay journal.

But apart from this cardinal defect of inadequacy, Dr. Ball's book contains many inaccuracies which show very clearly that the author has not paid as much attention to the writing of it as to its embellishment. For instance, it is stated that Monte Cassino is "near the city of Salernum" (p. 5), though it is at least 100 miles away, and the cathedral town of Cremona is described as "a small Milanese village" (p. 119). Such statements as that the Inquisition was introduced into Italy "from Spain in 1224" (p. 13), or that Ignatius Loyola was at the head of the Theatine order in 1537 (p. 73), have no warrant in history. There is an error even in regard to the size of the *Fabrica*. Dr. Ball says there are 659 pages of text, whereas there are really 663. Again, we are twice informed (pp. 119 and 132) that Vesalius went to Madrid in 1544, whereas Roth has conclusively proved that he first journeyed to Spain in 1559. As a last instance we may mention the assertion that in 1546 Vesalius "published a new edition of his treatise on the

China root" (p. 132). Now this letter which Vesalius wrote to Roelants is dated June 1546, and the first and only edition of it was published by his brother, Francis Vesalius, four months later.

Nor is Dr. Ball much happier as a critic. Great interest and considerable discussion have centred on the question as to what artist was responsible for the Vesalian illustrations. That John Stephen von Calcar drew some of them is undoubted, but there is strong evidence to show that the rest were from the hand of Vesalius himself. Our author, without entering into the merits of the matter, dismisses the subject with the strangely uncritical remark that "such a view would credit the comparatively short and busy life of the great anatomist with too much accomplishment" (p. 89). Again, the reason which induced Vesalius to make a pilgrimage to Jerusalem has given rise to much controversy. Here, also, Dr. Ball does not give us a hint as to the various versions, but contents himself with detailing that of Languetus, which is taken *verbatim* from Morley's article. This story is to the effect that Vesalius in the midst of a post-mortem examination found his "subject" to be still living; that he was on that account condemned to death by the Inquisition, and that only upon the earnest entreaty of Philip II. was this sentence commuted to that of a pilgrimage. Much might be said upon this strange narrative. We content ourselves with two remarks—first, Languetus does not vouch for the truth of his story, which he casually mentions as having heard; and, secondly, Languetus is the one and only authority for it. The minutes of the Inquisition, the history of Spain, contemporary records—all have been searched in vain for a single corroboration, and yet this extraordinary romance is the only reason for the pilgrimage which Dr. Ball thinks worth repeating. Upon it he stakes his critical acumen that it is "the most reasonable account."

In conclusion, it is only fair to say that Dr. Ball writes easily and tells his story well. Had his work been an article contributed to the pages of a medical journal we would have regarded it more indulgently. But the high price charged for the book, and its superb setting, might lead to its being accepted as an authoritative life of Vesalius, and it has thus been necessary to emphasise its deficiencies and to contest its authority.

The Experimental Chemotherapy of Spirilloses (Syphilis, Relapsing Fever, Spirillosis of Fowls, Framboesia). By PAUL EHRLICH and S. HATA. Translated by A. NEWBOLD, and revised by ROBERT W. FELKIN, M.D. Pp. 156. London: Rebman, Ltd. 1911. Price 12s. net.

THIS interesting volume gives a complete account of the methods by which the now well-known substance "606" was discovered and tested

scientifically before being given out to the world as a therapeutic agent.

The first part is by Hata, and in it he describes the various arsenical compounds and their effects on animals infected with the spirillum of relapsing fever, on the spirillosis of fowls, and on rabbits infected with the spirochæta pallidum. The advantages and disadvantages of each compound are described, and the superiority of "606" over all the others clearly brought out. The experiments are very thorough, are fully controlled, and represent an immense amount of careful and painstaking work. This section of the book is a model of how scientific research work should be carried out and the results recorded.

The second part consists of contributions by Nichols (New York) on the action of "606" on spirochæta pertenuis on the animal body; by Iversen (St. Petersburg) on the action of various arsenical compounds, including "606," in relapsing fever, showing the extraordinarily good effects of the latter on the disease; and by Bitter and Dreyer (Cairo) confirming Iversen's results with "606" in relapsing fever.

The third part is by Ehrlich, who states the various steps which led up to the use of "606." This section has a more clinical interest than the others, the dangers and contra-indications of the drug being clearly outlined. Ehrlich makes a strong claim for the use of "606" in syphilis in suitably selected cases, and one cannot but admire the frank way in which he acknowledges its limitations.

The whole work is a triumph to modern scientific research, and shows the possibilities of the principle of treating disease by the "therapia magna sterilisans." It is illustrated by two plates and numerous charts of experiments. It is unfortunate, however, that the translation has not been more successful. There are numerous mistakes, and in parts the construction is not English.

Human Physiology. By Professor LUIGI LUCIANI, Director of the Physiological Institute of the Royal University of Rome. Translated by FRANCES A. WELBY; edited by Dr. M. CAMIS, Institute of Physiology, University of Pisa. In Four Volumes. Volume I. Pp. 592. London: Macmillan & Co., Ltd. 1911. Price 18s. net.

THE text-book of physiology written by Professor Luciani has already been translated into French, German, and Russian, but it is only now that an English translation of the first of the four volumes has been published. The translation is thoroughly good and is remarkably free from the defects and errors that are so often encountered in English translations of medical works.

The first three chapters are devoted to Living Matter—its chemical

and physical basis, its fundamental properties, and the conditions by which it is determined. The author then considers the blood, discussing the methods of examination, the character and origin of its constituents, its coagulation, and the physical properties of blood plasma. In Chapter VI., which deals with the discovery of the circulation of the blood, the researches of Columbus, Servetus, Vesalius, Cesalpinus, Harvey, and Spallanzani are epitomised. According to Luciani, "the great honour of having first recognised and demonstrated the general circulation of the blood" belongs not to Harvey but to Cesalpinus. The chapters upon the mechanics of the heart are full of closely-reasoned argument, and are the more interesting in that the opinions expressed do not always coincide with those taught by English physiologists. The conflicting doctrines of the myogenetic and neurogenetic theories are subjected to critical analysis, and a most interesting account is given of the author's classic researches on periodic rhythm of the heart.

The second half of the volume deals mainly with the chemistry, physics, and mechanics of respiration, and with the nervous control of the respiratory rhythm. The experimental work on periodic respiration, including Cheyne-Stokes respiration, is fully described. The final chapter is concerned with the physiology of the lymphatic system. As Professor Langley says in a preface, the book has the unity of view and sense of proportion that are so often wanting in text-books of multiple authorship.

Practical Forensic Medicine: a Police Surgeon's Emergency Guide. By C. GRAHAM GRANT, L.R.C.P.&S.E. Second Edition. Pp. 90. London: H. K. Lewis. 1911. Price 2s. net.

IN the second edition of this little volume the author has had the advantage of revision by Dr. F. J. Smith, the editor of Taylor, but the work as a whole bears his own imprint, and is characteristically modest and yet racy, and at the same time intensely practical. It simply bubbles over with useful tips for a police surgeon, not merely for emergencies but for his everyday work, which perhaps largely consists of what would be emergencies for other people. There are some things one might cavil at. The hints on the detection of blood-stains and on the detection of spermatozoa are not so full as they might be: the directions for microscopic examination should either be fuller or be omitted altogether—they are useless as they stand. There is nothing said about gonorrhoea in connection with criminal assaults, especially in children. Better first-aid directions for strychnine poisoning might be given than "wash stomach: emetics: pot. brom. 2 drachms, tannic acid." Still, these are minor points, and on the whole we can most heartily recommend this little book to every police surgeon nay, to every general practitioner. Sooner or later he will be thankful to have it.

Manual of Physiology for Students and Practitioners. By H. WILLOUGHBY LYLE, M.D., B.Sc.(Lond.), F.R.C.S.(Eng.). Pp. 747. London: Henry Frowde and Hodder & Stoughton. 1911. Price 15s. net.

TEXT-BOOKS of physiology are numerous, and the student has a wide choice of standard works all good in their own way. New editions of old favourites are constantly appearing, and it would seem a matter of extreme difficulty for an entirely new book to enter the select circle. The ostensible reason for the publication of Dr. Lyle's *Manual of Physiology* is that most of the text-books have grown too large, and an attempt is made to produce a smaller volume which shall nevertheless contain the essential facts of physiology in as concise a form as possible. The author has succeeded admirably in doing this, and has produced a moderate-sized volume replete with information. The material is well up to date, clearly expressed, and the text shows signs of careful editing. The arrangement of the subject is somewhat unusual, the preliminary chapters containing an account of the chemistry of the body and of the food stuffs, enzymes and their actions are next considered, then diet and digestion. The opening chapters strike one as being rather difficult for the student just beginning the study of physiology. If he has already received a good grounding in organic chemistry they present no difficulty, but too often this is not the case. Apart from this drawback, which is almost a necessary result of condensation, the book is an excellent one, and should prove very useful to the student in preparing for examination. Practitioners will also find in it a convenient volume for refreshing their knowledge of physiology and obtaining a brief résumé of the more recent work.

Practical Bacteriology, Blood Work, and Animal Parasitology. By E. R. STITT, A.B., Ph.G., M.D. Second Edition. Revised and Enlarged. Pp. 345. London: H. K. Lewis. 1911. Price 6s. 6d. net.

As it is little more than a year since the first edition of this volume appeared, full reference need not be made to each section of it. It has been partly rewritten and brought thoroughly up to date. Numerous new illustrations have been added. It treats the subject in a practical manner, as little space as possible being devoted to theory. It will be found especially useful to those who practise in the tropics.

A Text-Book of Medical Diagnosis. By JAS. M. ANDERS, M.D., and NAPOLEON BOSTON, M.D. Pp. 1195. With 418 Illustrations and 25 Plates. Philadelphia and London: W. B. Saunders Co. 1911. Price 25s. net.

THIS large volume deals with the subject of medical diagnosis in a very comprehensive manner. It is a book for senior students and practi-

tioners. The methods of examination of the patient, pathological fluids, blood, etc., are given in detail, but, in addition, the diseases of the different organs are taken up separately and fully described clinically. Typical cases from the authors' practices are recorded to illustrate the more important maladies. Special stress is laid on differential diagnosis, and in order that the reader may see at a glance the distinguishing signs of diseases, numerous diagnostic tables have been arranged. The illustrations of apparatus, methods of examining patients, typical examples of diseases are, without exception, excellent. A peculiar feature of the illustrations of diseases of the nervous system is the introduction of full-page plates of series of moving pictures to illustrate the gaits of different diseases. Each plate contains 72 small photographs, and the series gives quite a good representation of the movements of the limbs. There are also several good coloured illustrations. The volume is thorough, complete, and up to date, covering the whole field of internal medicine, including fevers, and can be recommended as a text-book which puts medicine before the student in a much more practical and interesting manner than the usual systematic manual.

Differential Diagnosis: Presented through an Analysis of 383 Cases.

By RICHARD C. CABOT, M.D., Assistant Professor of Clinical Medicine, Harvard Medical School. Octavo of 753 pages. Illustrated. Philadelphia and London: W. B. Saunders Co. 1911. Cloth, 24s. net.

THIS book is a very interesting attempt to study and teach diagnosis from the point of view of the presenting symptom. It is a sustained effort of reasoning almost from the first to the last page of the book, unencumbered by any exposition of technical methods. The plan adopted is that in use in hospital clinics, and a very successful endeavour is made to bring the clinic to one's easy chair. It teaches the reader to associate each clue or combination of clues with its own set of "leadings." Granted that he knows physical signs, the reader learns in each case what are the possible explanations of the phenomena, and he is guided in no uncertain way in sifting the probabilities and to arrive at an accurate diagnosis. As the author says, "cases do not come to us systematically arranged like the account in a system text-book of medicine;" they come with presenting symptoms which in the majority of cases give many "leadings." For the young practitioner this book will prove of the highest value in guiding him on the narrow way that leads to correct diagnosis. It is scarcely less valuable to the experienced physician. There are a few verbal errors which will doubtless be rectified in a second edition. The statement in the beginning of the second paragraph of page 48 obviously refers to the neck, not the "thyroid." The book is copiously and well illustrated.

Manual of Medicine. By T. K. MONRO, M.A., M.D. Third Edition. Pp. 1023. London: Baillière, Tindall & Cox. 1911. Price 15s. net.

THE third edition of this text-book has been thoroughly revised so as to bring it up to date. It has been somewhat increased in size. In addition to internal medicine it includes fevers and diseases of the skin. It gives a concise description of the various diseases and their treatment, and can be recommended as a very reliable text-book for students.

Allbutt's System of Medicine. Vol. XI. "Diseases of the Skin."

THIS, the last volume of the System, is by no means the least valuable of an excellent series. It will be specially prized by the specialist, in that it contains a series of thoughtful essays on various subjects from the pen of Dr. Colcott Fox, who, we think, unfortunately chooses to hand down his views to posterity in such contributions rather than in a work of his own.

There are articles by many well-known specialists, and those by Dr. H. G. Adamson will be found specially worthy of perusal, they are so free from bias and so like the summing up of a really capable judge.

We cannot conscientiously praise the illustrations. Black and white illustrations of skin diseases are often of some value to the expert when printed on plate paper, but when they appear in the text even this value is diminished; but every specialist in skin diseases will profit from the study of the text.

Child-Nurture. By HONNOR MORTEN. Pp. 240. London: Mills & Boon. 1911. Price 3s. 6d. net.

ACCORDING to the statement in the Preface this book originates in "a desire to present child study from the parents' point of view." The author has aimed at producing a work "eminently practical and simple and complete in itself," and it may fairly be said that she has succeeded. The book is simple and practical, and will be both suggestive and helpful to parents who have had little or no scientific training. It was a happy thought to give the account of a baby's early growth in the form of letters from a proud young mother, and no one can fail to be interested in "Treasure's" development. The introductory chapter, giving the story of child study, forms a reliable guide to readers with respect to the present state of the movement: the chapter on special children (delicate, nervous, and defective), and that on children who need help, are eminently calculated to be productive of good, keeping clear as they do of vague generalities, and making definite and useful suggestions.

At the same time, while the book is strong on the practical side, it is only right to say that it is regrettably weak in psychological theory. The use of terms is loose, and statements are made which no psychologist would homologate. Thus grief is termed a "simple emotion" (p. 148): the child is said to be "instinctively" a reasonable being (p. 157): "some children are *born* with a sense of the ridiculous," which is primarily a "sense of happiness" (p. 160). The statement that "there are always two aspects to every emotional quality, the purely psychological and the mental" (p. 145), may be due to a misprint, but it would be hard to justify the use of the term "psychological" in the following:—"Regret comes almost under the same category as shame, but it is slightly more psychological, as it implies the act of *remembrance* of the fault and its sad consequences as well as the act of contrition" (p. 84).

An Introduction to Therapeutic Inoculation. By D. W. CARMALT JONES, M.A., M.D. Pp. 165. London: Macmillan & Co., Ltd. 1911. Price 3s. 6d. net.

THIS book is divided into two parts. The first part states in a very simple and common-sense way the principles of immunity and therapeutic inoculation. The second part deals with the treatment of many conditions with vaccines. Only those infections are considered on which considerable work has been done and reliable information is available. The author gives statistics, which are chiefly drawn from the out-patient records of the Department of Therapeutic Inoculation of St. Mary's Hospital. There is an appendix on the technique of making vaccines and estimating the opsonic index. Several large plates illustrate this part of the work. The volume is well written and the subject presented in an easily understood form. To those wishing to get a working knowledge of the application of vaccines in practice we would heartily recommend this volume.

Refraction of the Eye. By ERNEST CLARKE, F.R.C.S. Third Edition, revised. Pp. 228. London: Baillière, Tindall & Cox. 1911. Price 5s. net.

WE gladly welcome a third edition of this well known handbook on the refraction of the eye. The work has been carefully revised throughout, and such additions and illustrations have been made as were necessary to bring it up to date.

It is essentially practical, all unnecessary matter being omitted. The student will find it one of the most useful and reliable guides available on the subject. Indeed it is impossible to recommend the

book too strongly to students of medicine who wish to have an up-to-date, clear, and accurate guide to the study of the errors of refraction and accommodation of the eye.

The reviewer has used the second edition of this work in his university classes since it was issued, and he has found it an excellent and convenient book for teaching purposes. The present edition is an improvement even on its immediate predecessor, which places the book in an unassailable position as one of the best, if not the best and cheapest book of its kind, on the subject in this or any other language.

Dental Materia Medica, Pharmacology, and Therapeutica. By CHARLES W. GLASSINGTON, M.R.C.S., L.D.S.(Edin.). Second Edition, revised and enlarged. Pp. 278. London: J. & A. Churchill. Price 6s. net.

THE author has done his work well, and while the work seems principally for the practical instruction of the student, the busy dentist will also find it a very handy reference book in his everyday practice.

It is thoroughly up to date, many drugs such as are not to be found in the B.P., but are in daily use in the dental surgery, being described.

There is a short chapter on Local Anæsthesia, and another on The Mummification of the Pulp, both of which subjects are treated in a thoroughly practical manner.

Dr. Carmalt Jones adds a chapter on The Application of Bacterio-Therapeutics to Dentistry, which is mainly interesting from his remarks on the pathology and treatment of pyorrhœa.

Diseases of the Anus, Rectum, and Sigmoid. By SAMUEL T. EARLE, M.D., Emeritus-Professor of Diseases of the Rectum in the Baltimore Medical College. Pp. 462. Philadelphia and London: J. B. Lippincott Co. 1910. Price 21s.

DR. EARLE aims at presenting a systematic survey of the pathology, clinical features, and treatment of diseases of the anus, rectum, and sigmoid. He has no original work or views of importance to record, nor does he present the results of the clinical experience which he may have had in such a form as to make his record of value to others. The book consequently lacks interest and does not seem destined to supplant others already in the field. It is well printed and contains some good illustrations.

Lateral Curvature of the Spine and Flat-Foot, and their Treatment by Exercises. By J. S. KELLETT SMITH, F.R.C.S. Pp. 134.
Bristol: John Wright & Sons, Ltd. 1911. Price 5s. 6d.

THE scope of this book is described by the author as being limited to the "treatment of those cases of spinal curvature which are most likely to present themselves in general practice."

Only those types of curvature which are not due to any definite pathological lesion, and which are amenable to treatment by exercises, are discussed, and no reference is made to the treatment of the more advanced cases in which there are marked bony changes.

From the point of view of the general practitioner, undoubtedly, the most useful feature of the book is the detailed instruction as to the exercises suitable for the different forms of curvature. Klapp's original crawling exercises and their elaborations with various supplementary exercises are clearly described and illustrated.

The author gives a description of a simple method of his own invention for taking footprints, which not only shows the area of contact of the foot with the ground, but also, by the variation in the intensity of the colour of the print, demonstrates the distribution of weight at the different points of the foot.

The subject of flat-foot is, as a whole, very shortly dealt with, and the only forms of treatment mentioned at any length are the use of exercises and the employment of Thomas's method of elevation of the inner side of the boot.

The last chapter in the book is entirely given to the treatment of anemia and chlorosis by various forms of iron and oils. Although, as the author explains, anemia and malnutrition are very commonly seen with lateral curvature, the inclusion of this chapter, in a book of this scope, seems somewhat superfluous.

The illustrations, with which the book is well filled, are excellent, and are of very considerable aid to the thorough understanding of some of the more intricate exercises.

Text-Book of Massage. By LOUISA L. DESPARD, Member and Examiner, Incorporated Society of Trained Masseuses. Pp. 290. 203 Illustrations. London: Henry Frowde and Hodder & Stoughton. 1911. Price 10s. 6d.

THE wide range of subjects treated in the Oxford Medical Publications has been still further extended by the issue of this text-book on massage. The chapters on general and regional massage are obviously written by one of large experience. The descriptions are clear and concise, and the illustrations from photographs are excellent. Several of the line drawings of bandages transgress the fundamental

laws, and one of them is wrongly described as an ascending spica of the groin. More than half the book is taken up with anatomy, and these chapters are illustrated by a hundred and twenty figures from Cunningham's *Text-Book of Anatomy*. This section might well be reduced and more room found for physiology. We cannot believe that such minutiae as are included are essential for any masseur. The final chapter of the book deals with electrical methods in conjunction with massage, and includes reproductions of Erb's diagrams of the motor points of the head, neck, and limbs.

Dental Surgery and Pathology. By J. F. COLYER, L.R.C.P., M.R.C.S., L.D.S., Dental Surgeon to Charing Cross Hospital and the Royal Dental Hospital. Being the Third Edition of "Diseases and Injuries of the Teeth," by Morton Smales and J. F. Colyer. Pp. 1000. London: Longmans, Green & Co. 1910. Price 25s. net.

WE heartily welcome this third edition of a well-known and popular text-book, but it is so very much larger than the last edition, and has been so extensively re-written, that it may almost be regarded as a new work. The author has strikingly fulfilled his "attempt to bring the study of dental pathology in line with the current knowledge of general pathology, and to identify the causes underlying diseases of the teeth with those underlying diseases in general." In this he has had the help and co-operation of many men well known as specialists in their own departments, and the addition of a carefully selected bibliography at the end of each important section should be of great use to the student, as well as an incentive to further study. Considering the highly specialised character of operative dental surgery, it would be unreasonable to expect in such a work as this sufficient detail to be of very much use, and so it is perhaps hypercritical to express the opinion that "treatment" does not so fully as do "etiology" and "pathology" reflect the latest and soundest teaching of to-day. The book is a valuable addition to dental literature, and should prove most useful to the general medical practitioner who wishes a book of reference on dental surgery.

Operative Midwifery. By J. M. MUNRO KERR, M.D., C.M.(Glas.), Professor of Midwifery and Diseases of Women, Anderson's College Medical School, etc. Second Edition. With 299 Illustrations. Royal 8vo. Pp. xiv., 703. London: Baillière, Tindall & Cox. 1911. Price 21s. net.

THE second edition of Munro Kerr's *Operative Midwifery* comes as no surprise to those who reviewed the first edition and realised how admirably the work filled a blank in our British obstetric literature.

it was to be expected that the author would soon have to pass the sheets of his book under his eye a second time. Comparatively few alterations have been made, for comparatively few changes in practice have taken place in the short time which has elapsed since the publication of the first edition; but there has been some polishing of the material, which has improved the work as a whole. Under Cæsarean section we note that the author has returned to the use of silk sutures for the uterine wound, for he no longer operates in infective cases, and therefore the risk of the silk becoming infected has been greatly reduced. Reference is made to the extra-peritoneal incision in Cæsarean section (on p. 412), and the reader is promised a full description of it at the end of the chapter, where it is found, with some difficulty (p. 431), under the heading of "Results to Mother and Child." The author has no practical experience of it, and seems little in favour of it. There does not appear to be any reference to the use of pituitary extract in post-partum shock. A few printer's errors have been noted, *e.g.* Phannenstiel for Pfannenstiel. As a whole, the work well deserves the hearty reception it has got.

Transactions of the American Gynecological Society. Vol. XXXV. for the Year 1910. Pp. lxii. 566. With Plates. Philadelphia: Wm. J. Dornan. 1910.

THIS volume contains the papers read at the thirty-fifth annual meeting of the American Gynecological Society, which was held at Washington. After a short address by the President (Dr. Edward P. Davis) a long list of admirable articles dealing with many subjects of interest is set forth, and in this list we find papers on renal and vesical surgery and on many obstetrical matters (eclampsia, Cæsarean section, puerperal sepsis, and pubiotomy) as well as upon what are more strictly termed gynecological matters (fibroid tumours, etc.). The significance of the word *gynecology* would seem to be less accurately fixed than it formerly was, and perhaps this is what the President was referring to when he said "at present the modern gynecologist operates upon men and women alike, the surgeon in turn performing many operations on women." Dr. Davis has a word or two of warning for the American people. "If this Republic is to endure, its women must bring to its altars not the paste jewels of an artificial luxury but those gems which made immortal the mother of the Gracchi;" and he goes on patriotically, "Gynecology is an American science, of which America may well be proud. Let us see to it that it serves faithfully the land of its birth." We on this side of the Atlantic can at least say with warmth, "long live the American Gynecological Society!"

A Text-Book of Gynaecological Surgery. By COMYN BERKELEY, M.A., M.D., B.C., L.R.C.P., M.R.C.S., and VICTOR BONNEY, M.S., M.D., B.Sc., F.R.C.S., M.R.C.P. Pp. 710. With 392 Figures and 16 Coloured Plates. London, New York, Toronto, and Melbourne: Cassell & Co., Ltd.

THIS admirable text-book gives the personal methods of the two authors in their conduct of gynaecological operations. They have treated the subject fully, beginning with chapters on Surgical Technique, Arrangement of Theatre, Preparations for Operation in Private Houses, and Pre-operative Treatment of the Patient. The individual operations are then taken up in detail, and the last part of the book deals with Post-operative Treatment and Complications.

The descriptions of the various operations are exceedingly good, and, taken along with the simple but clear illustrations in the text (executed by Bonney), cannot fail to appeal both to the experienced gynaecologist and to the practitioner seeking instruction for the performance of some operation for the first time. In this latter respect we know of no better guide. Where all is so good it is not easy to single out any one section, but special mention may be made of the chapters on Wertheim's Operation for Cancer of the Uterus and of those dealing with After-Treatment.

Atlas of Microscopic Diagnosis in Gynecology, with Preface and Explanatory Text. By Dr. RUDOLPH JOLLY, Berlin. Translated by P. W. SHEDD, M.D., New York. With 52 Lithographs in Colour and 2 Figures in the Text. London: Rebman, Ltd. Price 25s. net.

THIS atlas illustrates the common pathological conditions of the endometrium as met with in scrapings from the uterus and cervix. The title is therefore rather comprehensive for all the book contains. The coloured illustrations are exceedingly well reproduced, and have been carefully selected to illustrate the normal structure and chief pathological changes of the endometrium. The descriptions in the text are, however, very confusing, and have obviously suffered in the translation, so much so that many of them must be quite unintelligible to one unacquainted with this department of pathology. The plates are so good that it is to be hoped that in any future issue the text will be thoroughly revised.

Transactions of the Glasgow Obstetrical and Gynæcological Society. Vol. VII. Sessions 1908-1909, 1909-1910. Pp. 208. Glasgow: Alex. Macdougall. 1911.

THE work done at the meetings of the Glasgow Obstetrical Society during the two sessions comprised within this volume comes up to the standard of excellence which we have been taught by previous experience to expect. The more lengthy communications include the subject of pyelitis complicating pregnancy and the puerperium by Dr. W. D. Macfarlane, Junr.; that of ovarian tumour under similar circumstances by Dr. Balfour Marshall; that of difficulties in the diagnosis of abdominal diseases by Dr. Lawrence Oliphant; that of the management of the ureters in abdominal pelvic operations by Dr. R. C. Buist (of Dundee); and that of the treatment of fibroids of the uterus by Dr. Nigel Stark. There is also the address on the treatment of labour in contracted pelvis by the Honorary President, Professor F. Schauta of Vienna; and it must be confessed that the Honorary President did not exaggerate when he spoke of his proposals as going far along a road hitherto little travelled by obstetricians in this country. The volume contains many short papers, some of them of such interest as to deserve elaboration, on a great variety of subjects dealing with obstetrics and gynecology.

Health to Date: The Modern Doctor: with Newer Methods of Cure: as explained by W. T. FERNIE, M.D., Author of "Herbal Simples," "Precious Stones," &c. Pp. ix. and 477. Bristol: John Wright & Sons, Ltd. 1911. Price 4s. 6d.

VERITABLY an odd book. The writer who, as he pleasantly explains, is a physician of advanced years, makes in this volume his last venture, sings his swan-song; though, as he hastens to add in quaint and modest disparagement, the swan is "a bird of uncertain temper while alive," chiefly to be prized when its vocal efforts are concluded, and wholly delectable only when roasted, so that of it, at least, it may be said with truth as well as with decorum, "*de mortuo nil nisi bonum.*"

The author in the serenity of his evening surveys a wide prospect, and discourses concerning it with genial garrulity and frequently piquant irrelevance. How wide his survey of life and of health and the things that make and mar it may be inferred from the fact that the catching of tench and the healing touch, tea, toast, tomatoes and tobacco, town life and tuberculin, turtle, turkeys, tapioca, and twins, are each and all gaily and suggestively and even poetically discussed!

Health to Date, in a word, is not a contribution to serious medicine, nor indeed a very serious contribution to anything, but rather a book

of hygienic causerie, tinged with the occult, brimming with fun in anecdote and quotation, bright with a mellow humour and a venerable indulgence, and suffused with a gentle piety; above all things discursive; a book of table-talk in a double sense, since topics of food and feeding furnish the matrix in which innumerable pleasant things find place.

The style of the book is a blend of *The Compleat Angler*, *The Anatomy of Melancholy*, *The Pleasures of Life*, and *Over the Teacups*; and the long sentences, the far from rare irrelevancies, and the pedantry which first gives the Latin quotation and then, assuming the reader's ignorance, translates it, are no more out of place than the spectacles, the wrinkles, the rubicund countenance and the twinkling benevolence of expression with which, in fancy, the reader irresistibly endows the writer.

International Clinics. Vols. II. and III. Philadelphia and London : J. B. Lippincott Co. 1910.

THESE two volumes of this well-known quarterly are fully up to the usual standard. The majority of the writers as usual are from across the Atlantic, but Drs. J. W. Ballantyne and Robert Jardine have interesting contributions (in Vol. II.) on "Puerperal Eclampsia," the former dealing with its "contingent treatment." The same volume has also a noteworthy essay by Roland C. Curtin, M.D., on "The Book-Plates of Physicians," containing over a score of illustrations in which the artistic simplicity of such an instance as Wendell Holmes appears in marked contrast to those of some of the Continental and present-day American physicians. Vol. III. has, amongst many readable contributions, an illustrated article dealing with uncinariasis, the disease due to the native variety (in the New World) of *anchylostoma duodenale*; and one on the "Philosophy of Lancing Teeth." The type and paper as usual make the volumes pleasant to read.

Handbook of the Surgery of the Kidneys. By W. BRUCE CLARKE, M.A., M.B.(Oxon), F.R.C.S. Pp. 193, with 5 Plates and 50 Illustrations. London: Henry Frowde and Hodder & Stoughton. 1911. Price 10s. 6d.

THIS small volume expresses the personal views of the author. Many interesting cases are cited, and the illustrations are excellent, but it is difficult sometimes to realise whether they are taken from the actual

specimens from the cases mentioned, or whether they are taken from other specimens in St. Bartholomew's Hospital museum, with the view to illustrate the text. The skiagrams are said to "illustrate the actualities of everyday practice." If such be the case the author is indeed fortunate in his X-ray photographer. In Chapter II., which deals with the methods of examination of a patient, no mention is made of palpating the kidney with the patient in the erect position; the "kneeling position," of which an illustration is given, is recommended as an alternative to the dorsal.

A Text-Book of General Bacteriology. By EDWIN O. JORDON, Ph.D. Second Edition, thoroughly Revised. Pp. 594. Philadelphia and London: W. B. Saunders Co. 1910. Price 13s. net.

THIS text-book, already well known in this country and in America, has been revised, corrected, and brought up to date in the present edition, so that we have no hesitation in saying that it is one of the best books of its kind both for students and graduates.

In arrangement the work resembles its first edition, but a considerable amount of new material is introduced, more especially in relation to immunity.

Our Baby: For Mothers and Nurses. By MRS. J. LANGTON HEWER, Certified Midwife. Thirteenth Edition. Illustrated (83rd Thousand). Pp. 176. Bristol: John Wright & Sons, Ltd.; London: Simpkin, Marshall, Hamilton, Kent & Co. Ltd. 1911. Price 1s. 6d.

THE first edition of this useful little book appeared in 1891; now it has attained its twentieth year of life, its thirteenth edition, and its 83rd thousand. Before these facts the reviewer is dumb.

What a Mother should Tell her Little Girl. What a Mother should Tell her Daughter. What a Father should Tell his Little Boy. What a Father should Tell his Son. By ISABELLE THOMPSON SMART, M.D., Medical Examiner of Defective Children, Department of Education, City of New York, etc. Four Volumes. Published by the Bodmer Company, New York.

THESE four volumes constitute a series of booklets written by a lady, and telling the story of the mysteries of life in simple, plain words.

The facts are stated with delicacy as well as clearness, and the advice is always good and likely to be helpful to children and young adults. This could not be affirmed about all works of the type to which these belong, but it can be truly said of them. The children's question, "Where do babies come from?" is answered plainly and yet with a reverent touch.

Studies in Cardiac Pathology. By GEORGE WILLIAM NORRIS, A.B., M.D.
Pp. 233. Philadelphia and London: W. B. Saunders Co. 1911.
Price 21s. net.

THE basis of this monograph is provided by eighty-five excellent reproductions of specimens in the hospital museums of Philadelphia. The accompanying text is mainly explanatory. All the common diseases of the pericardium, heart muscle and valves are depicted, and several beautiful examples of congenital abnormalities are shown. Aortic aneurysm is not included in the series.

Medical Diagnosis. By W. MITCHELL STEVENS, M.D., M.R.C.P. Pp. 1571. London: H. K. Lewis. 1910. Price 25s. net.

THE work describes the ordinary clinical methods of medical examination and discusses medical diagnosis. General symptoms and physical signs are considered in the first 85 pages. The symptomatology and diagnosis of the various infective diseases, diseases due to animal parasites, intoxications, and poisonings are next discussed, and subsequent sections treat of the affections of the bones, joints, and muscles. Thereafter the blood, glands, constitutional affections, pharynx, larynx, eye, ear and nose, the lungs, circulatory system, urinary organs, abdomen, and nervous system are dealt with in turn. The book contains a great deal of information carefully arranged and classified, and numerous cross-references in the text, together with well-chosen illustrations, enhance its value considerably. The book is one to which the reader may refer with confidence for aid in diagnosis by classical and well-established clinical methods. The author, however, tells us little or nothing concerning many modern diagnostic methods such as the bacteriological examination in cases of suspected diphtheria and phthisis, the recognition of malarial parasites, the detection of occult blood in feces, the methods of estimating blood-pressure, the tuberculin tests, Röntgen diagnosis of the thoracic and gastric affections, and the serum diagnosis of typhoid and of syphilis. If the scope of the work did not permit of full information being given regarding such matters, and even if the book be designed for the student and general practitioner, a brief account of the newer diagnostic procedures might have been incorporated with advantage.

NOTES ON BOOKS.

THE *Transactions of the American Association of Genito-Urinary Surgeons* for 1910 (Vol. IV.) (Frederick H. Hitchcock, New York) contains, in addition to a number of interesting papers on the surgery of the urinary organs, a special series of communications on vaccine treatment in gonococcic and other infections of the genito-urinary tract.

The Medical Annual, 1911 (John Wright & Sons, Ltd.), fully maintains the standard of its predecessors. To the practitioner anxious to keep abreast of the progress of medicine and surgery it is an indispensable survey of new remedies and forms of treatment. Without it he would be like a mariner without chart or compass, bewildered by the vastness of the surrounding sea.

A great merit of the book is its skilful arrangement of detail. In a short introduction the great landmarks of progress during the year are indicated, and, further, each collaborator reviews the outstanding events of his department before presenting its detailed record. In this way a most useful perspective view is obtained; while in the summarising of papers and articles we are given not merely a mechanical extract but a vital digest, condensation being supplemented by commentary. In the present volume a slight innovation is introduced. Drugs mentioned in the section of therapeutics are again included in the Dictionary of New Treatment under the heading of the disease for which they are recommended. The book can be highly recommended as a guide-book to the practitioner in every department. In its general arrangement, in the clear and faithful summarising of original papers, in helpful commentary, and in efficient editing it is a model of excellence.

The employment of radiography in the diagnosis of bone disease has come to be almost indispensable, and the improvement in technique which has taken place within recent years has enabled skilled and careful radiographers to furnish us with pictures which are as nearly perfect as can be hoped for. There still remains, however, some difficulty in interpreting these, and Mr. Shenton's small work on *Disease in Bone, and its Detection by the X-rays* (Macmillan & Co., Ltd.) will be welcome as a guide to those who are not specialists in X-ray work. It contains an admirable selection of plates, and in the text the points in differential diagnosis are clearly indicated.

The fact that *A Dictionary of Domestic Medicine and Household Surgery*, by Spencer Thomson, M.D., L.R.C.S., J. C. Steele, M.D., and Geo. Reid, M.D., D.P.H. (Charles Griffin & Co.), has been before the public since the middle of last century, and that it and similar books are more than ever in demand—the present issue is the thirty-ninth edition—proves that with the increasing extent and complexity of medical knowledge, persons interested in the healing art and those whose duty it may be at times to render medical aid in the absence of a qualified practitioner have more and more need of medical books expressed in concise and simple language. There has sometimes been among short-sighted members of the medical profession a disposition to object to popular medical works, but it is now generally recognised that such books, if carefully written, serve only a beneficent purpose, by instructing the non-medical public in rational medicine, and by discouraging the indiscriminate use of much-advertised nostrums and acting as a counter-agent to the impudent quackery which preys upon the credulity and ignorance of simple principles of health too often found pervading the mass of the people.

It is inevitable that in so old a book some articles should be archaic in style and verbose in expression, and some of the subjects treated quite worthless at the present day. Those articles, however, which deal with more modern subjects like opsonins and appendicitis have been well written. There are some notable omissions—for example, it is disappointing to find no reference to so commonly used and useful a substance as boracic acid. The articles dealing with the commoner ailments are helpful, and we have found no part of the book that could be hurtfully used by any person of ordinary common sense.

The scope of *Regimen Sanitatis, etc.*, by H. Cameron Gillies, M.D. (Robert Maclehose & Co.), is indicated by its sub-title "The Rule of Health: a Gaelic Medical Manuscript of the Early Sixteenth Century or perhaps Older, from the *Vade Mecum* of the famous MacBeaths, Physicians to the Lords of the Isles and the Kings of Scotland for Several Centuries." There is an introduction giving an account of the family of MacBeath and of the origin and age of the text, probably as early as 1470 and certainly not as much as a century later. Then follows a photographic reproduction of the Gaelic MS., page by page, with interleaved transliteration into modern characters, followed by an English translation, notes, and a glossary. The translation and glossary appear to be carefully done so far as we have any means of judging, and the notes are excellent. The form of the book is tasteful, and it will be greatly appreciated by all who are interested in Gaelic literature or who wish to gain an idea of medicine in this country at the barbarous age when Gavin Douglas "gave rude Scotland Vergil's

page." The substance of the text is based upon the "Regimen Sanitatis," the famous Latin poem composed at Salerno about 1100, and it is evidently directly influenced by John of Gaddesden and Bernard de Gordon, who in England and France during the previous century wrote commentaries upon this poem. There are copious references to Haly Abbas, Avicenna, Galen, Hippocrates, and other Arab and Greek writers, but whether the Beaton verified their references from the original texts or simply copied them from John and Bernard does not appear.

The third edition of *A Synopsis of Surgery*, by Ernest W. Hey Groves (John Wright & Sons, Ltd.), contains not only the new methods of treatment which have been brought forward in the eighteen months which have elapsed since the second edition was published, but also a great number of points illustrating the advances in surgery made since the first edition was published three years ago.

The Student's Handbook of Surgical Operations, by Sir Frederick Treves, Bart., and Jonathan Hutchinson (Cassell & Co), has by judicious compression been kept of a convenient size for a student's handbook. The section on abdominal operations has been remodelled, some methods of operation being omitted to make room for others more recent and more practised. It undoubtedly is what it claims to be—a concise, clear and practical guide to the chief operations in surgery.

This volume (XVI.) of *The Johns Hopkins Hospital Reports* consists of five papers. First, "Studies in the Experimental Production of Tuberculosis in the Genito-Urinary Organs," by George Walker, M.D. Rabbits were selected for the experiments because they are more resistant than guinea-pigs, and instead of human tubercle bacilli used in a previous series of experiments, in this series only bovine tubercle bacilli were used. This paper extends to 223 pages, is beautifully illustrated, and contains a very complete bibliography.

The second paper, by the same author, deals with the "Effect on Breeding of the Removal of the Prostate Gland or of the Vesiculae Seminales, or of Both; together with Observations on the Condition of the Testes after such Operations on White Rats." This paper consists of a record of experiments made on the above subject. There were two series of experiments. From the experience gained in the

first series the investigator was able to obtain better results in the second series than in the first, and every experiment is duly detailed so that the next investigator will know exactly what has been done in this subject.

The third paper, by Dr. Davis, is on "Scalping Accidents." It is well written and well illustrated.

The fourth paper deals with "Obstruction of the Inferior Vena Cava, with a Report of Eighteen Cases," and is by Dr. Pleasants. The author deals exhaustively with the various causes of obstruction, the diseases in which the symptoms are manifested, but does not deal with the general treatment of the conditions producing obstruction.

The last paper, on "Physiological and Pharmacological Studies on Cardiac Tonicity in Mammals," is by Dr. Cameron. The numerous experiments made in the investigation are beautifully illustrated, and there is an admirable summary and conclusions too long to quote.

The whole volume is a record of scientific work of the highest order.

BOOKS RECEIVED.

ADLARD & SON.—Biographical Reminiscences. By Sir Samuel Wilks. Price 3s. 6d. EDWARD ARNOLD.—The House Surgeon's Vade-Mecum. By Russell Howard. Price 7s. 6d. The Mechanical Factors of Digestion. By Walter B. Cannon. Price 10s. 6d. The Diagnosis of Nervous Diseases. By Purves Stewart. Price 15s. Syphilis. By Jas. Macintosh and Paul Fildes. Price 10s. 6d. JOHN BALE, SONS & DANIELSSON.—The Essentials of Food. By Donald Stewart. Price 3s. 6d. Modern Surgical Technique. By C. Yelverton Pearson. Price 10s. 6d. 2nd edition. Theory and Practice of Thyroid Therapy. By H. E. Waller. Arthritis. By Peter Daniel. Price 12s. 6d. BAILLIERE, TINDALL & COX.—Operative Midwifery. By J. M. Munro Kerr. 2nd edition. Price 21s. Refraction of the Eye. By Ernest Clarke. 3rd edition. Price 5s. THE BODMER CO., NEW YORK.—What a Mother Should Tell Her Daughter. By Isabelle Thompson Smart. CASSELL & CO.—Diseases of the Ear and Throat. By St. Clair Thomson. Price 25s. A Manual of Physics. By Hugh C. H. Candy. Price 6s. Surgical Applied Anatomy. By Sir Frederick Treves. 6th edition. Price 9s. Hygiene and Public Health. By Sir Arthur Whitelegge and Sir George Newman. 12th edition. Price 8s. 6d. Diseases of the Skin. By Sir Malcolm Morris. 5th edition. Price 10s. 6d. J. & A. CHURCHILL.—Dental Materia Medica. By C. W. Glassington. 2nd edition. Price 6s. The Practice of Medicine. By Fred. Taylor. 9th edition. Price 18s. Domestic Hygiene for Nurses. By Fred. J. Smith. Price 2s. A Handbook of Physics and Chemistry. By H. Corbin and A. M. Stewart. 4th edition. Price 7s. 6d. A Manual of Bacteriology. By R. Tanner Hewlett. 4th edition. Price 10s. 6d. A Manual of Midwifery. By T. Watts Eden. 3rd edition. Price 15s. HENRY FROWDE and HODDER & STOUGHTON.—The Sensibility of the Alimentary Canal. By Arthur Hertz. Price 5s. Manual of Physiology. By H.

Willoughby Lyle. Price 15s. Clinical Surgery. By C. B. Lockwood. Price 5s. A Manual of Fevers. By Claude B. Ker. Price 7s. 6d. Tuberculous Diseases of Bones and Joints. By Sir W. Watson Cheyne. 2nd edition. Price 16s. Manual of Surgery. By Thomson and Miles. Vol. I. 4th edition. Price 10s. 6d. Practical Anaesthetics. By H. E. G. Boyle. 2nd edition. Price 5s. WILLIAM GREEN & SONS.—Quinquennium of Medicine and Surgery. 1906-1910. Price 10s. 6d. Reproduction in the Human Female. By James Young. Price 21s. FREDERICK HITCHCOCK.—Transactions of the American Association of Genito-Urinary Surgeons. Vol. VI. 1911. ULRICO HOEPLI.—Il Medico Pratico. By Carlo Marzo. 4th edition. Price lire 8.50. KELLY & WALSH, LTD., SINGAPORE.—The Etiology of Beri-Beri. By H. Fraser and A. T. Stanton. Price 7s. HENRY KIMPTON.—Delayed and Complicated Labour. By Robert Jardine. Price 7s. 6d. J. B. LIPPINCOTT Co.—International Clinics. 21st Series. Vols. I-II. 1911. Report of the Health of the City of Liverpool. 1910. H. K. LEWIS.—A Pocket Medical Dictionary. By G. M. Gould. 6th edition. Price 5s. Heart Sounds and Murmurs. By E. M. Brockbank. Price 2s. 6d. LONGMANS, GREEN & Co.—Dental Disease in its Relation to General Practice. By J. F. Colyer. Price 4s. 6d. Treatment of Neurasthenia. By Roger Vittoz. Price 3s. 6d. ALEXANDER MACDOUGALL.—Transactions of the Glasgow Obstetrical and Gynecological Society. Vol. VII. MACMILLAN & Co.—A System of Medicine. By Albutt and Rolleston. Vol. XI. Price 25s. Diseases of the Ear. By Milligan and Wingrave. Price 15s. Conduct and its Disorders. By Charles A. Mercier. Price 10s. The Treatment of Fractures by Mobilisation and Massage. By James B. Menell. Price 12s. MILLS & BOON.—A Manual for Nurses. By Sydney Welham. Price 3s. 6d. Nerves and the Nervous. By Edwin Ash. Price 5s. Child-Nurture. By Honnor Morten. Price 3s. 6d. JAMES NISBET & Co., LTD.—Auto-Inoculation in Pulmonary Tuberculosis. By Marcus Paterson. Price 21s. Bone-Setting and the Treatment of Painful Joints. By Frank Romer and L. Eliot-Creasy. Price 1s. REBMAN, LTD.—Cystoscopy as Adjuvant in Surgery. By O. Rumpel. Price 42s. Principles of Anatomy. By Wm. Cuthbert Morton. Price 42s. Atlas of Microscopic Diagnosis in Gynecology. By Rudolf Jolly. Price 25s. W. B. SAUNDERS Co.—Spirochaetes. By W. Cecil Bosanquet. Price 12s. Pathological Technique. By F. B. Mallory and J. H. Wright. 5th edition. Price 13s. A Text-Book of Physiology. By Wm. H. Howell. 4th edition. Price 18s. A Manual of the Practice of Medicine. By A. A. Stevens. 9th edition. Price 12s. 6d. SHERRATT & HUGHES.—Proceedings at a Conference on the Care of the Feeble-Minded. Price 6d. THE UNIVERSAL PRESS, HOWRAH.—Leprosy and its Treatment. By Pandit Kripáram Sarmá. 3rd edition. JOHN WRIGHT & SONS, LTD.—The Deaf Child. By James Kerr Love. Price 4s. 6d. Our Baby. By Mrs. J. Langton Hewer. 13th edition. Price 1s. 6d. The New Physiology in Surgical and General Practice. By A. Rendle Short. Price 4s. 6d. A Synopsis of Surgery. By E. W. Hey Groves. 3rd edition. Price 9s. 6d. Joint Tuberculosis. By Leonard W. Ely. Price 12s. 6d. Dental Anaesthetics. By W. E. Alderson. Price 3s. Health to Date. By W. T. Fernie. Price 4s. 6d. Index of Treatment. Edited by Hutchison and Collier. 6th edition. Price 21s.

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